

# College Catalog

(800) 422-NWTC • [www.nwtc.edu](http://www.nwtc.edu)



# Vision Statement

We will provide all learners the highest quality, lifelong learning opportunities that are

- what you want
- when you want
- where you want, and
- how you want them

so you may continue your learning and successfully engage in a career that enhances your quality of life in a global community.

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# Mission Statement

We are a two-year technical college, serving Northeast Wisconsin by providing education, training, and lifelong learning opportunities for individuals and businesses leading to the development of a skilled workforce. Our customers stimulate the economic vitality of our district as a result of the application of skills and knowledge acquired through the completion of certificates, degrees, diplomas, and courses.

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# Who to Contact

## General Information

Green Bay Campus...(920) 498-5400 or toll-free (800) 422-NWTC  
Marinette Campus .....(715) 735-9361  
Sturgeon Bay Campus .....(920) 746-4900  
Financial Aid (Enrollment Services).....(920) 498-5444  
Registration Information (Enrollment Services) .....(920) 498-5444  
Transcripts .....(920) 498-5579  
Veteran Services (Enrollment Services) .....(920) 498-5444

## Student Services

Admissions and General Program Information ..... (920) 498-5444  
Employment Assistance .....(920) 498-5528  
Multicultural Center.....(920) 498-5720  
Returning Adult Services .....(920) 498-5734  
Special Needs .....(920) 498-5444  
TTY Access .....(920) 498-6901

Tours .....(920) 498-5422

**Center for Careers and  
Student Employment**.....(920) 498-5422

**Skills Center** .....Communications/Reading Lab - (920) 498-5686  
Assessment/Testing Center - (920) 498-5427

**District Offices** .....(920) 498-5500

**Distance Learning - Video Courses**.....(920) 498-5571

**Interactive Television - TV Courses**.....(920) 498-5424

**Internet Courses** .....(920) 498-5503

**Employers: For contracted training and consulting, please call NWTC's  
Corporate Training and Economic Development**.....(920) 498-6911

**Toll-free – (800) 422-NWTC**

**Visit our website at [www.nwtc.edu](http://www.nwtc.edu)**



## Impressive Facts

- 2,244 students graduated from NWTC in 2008.
  - NWTC offers more than 102 associate degrees, technical diplomas, and apprenticeships plus 84 certificates.
  - The College serves approximately 41,500 students annually.
  - NWTC has transfer agreements with 28 colleges and universities covering 57 programs/certificates—including all associate degree programs.
  - NWTC served 1,165 businesses with customized training either on site or in the classroom in 2007-2008, training 22,589 employees.
  - NWTC's 2008 associate degree graduates earned \$31,202 (median annual salary) within six months of graduation.\*
  - More than 92.5 percent of 2008 graduates got jobs in Wisconsin and 72 percent of them were right here in the district.\*
  - NWTC was ranked among America's 20 fastest-growing large colleges in 2003, 2004, and 2006 by *Community College Week*.
- \*Source: NWTC 2008 Graduate Follow-Up Report*

## Out of 5,000 institutions nationwide, NWTC ranks:

- 22nd for the number of associate degrees awarded in Communication Technologies/Technicians and Support Services
  - 27th for the number of associate degrees awarded in Precision Production
  - 50th for the number of associate degrees awarded in Criminal Justice
  - 53rd for the number of associate degrees awarded to American Indian graduates
  - 47th for the number of One-Year Certificates awarded
  - 84th for the number of Two-Year Certificates awarded
- (Source: U.S. Department of Education Data published in Community College Week)*

# President's Message: Welcome, Futuremaker

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Welcome to the college where you can make your future.

You may already know that an NWTC education provides lasting career benefits and a basis for lifelong learning. That's why half of the high school seniors in our District enroll at NWTC within three years after high school graduation. That's why, in the past five years, half of the adults in our District have received education and training through NWTC. That's why employers want more NWTC graduates.

If you are still learning about NWTC, be ready to be amazed. Let us introduce you to faculty and staff who can spark your curiosity, expand your knowledge and foster your potential. Meet inspiring students of all ages who are mastering some of today's most advanced, complex technology. Discover innovative programs that offer essential training for Wisconsin's workforce. Learn how you can make a real difference in the world.

In the coming year, you may see the phrase "We Are Futuremakers" in your community. That message celebrates the students, faculty, staff and partners of NWTC. It celebrates the way Northeast Wisconsin uses creative thinking, hard work, community spirit and superior skill levels to stay on the cutting edge. It celebrates you—your achievements, your goals, your determination and your abilities.

So be proud. Your technical college education will allow you and your community to do more, today and tomorrow.

We Are Futuremakers.

And you're one of us.

H. Jeffrey Rafn, Ph.D.  
President

## NWTC Board of Trustees

David Mayer  
*President*  
Tony Vanderbloemen  
*Vice-President*  
John Gower  
*Secretary*  
Laurie Davidson  
*Treasurer*  
Phyllis Habeck  
Carla Hedtke  
Jeff Rickaby  
Dianne Van Riper  
Ben Villarruel



# District and Campus Information

Northeast Wisconsin Technical College is a publicly supported, high technology college working closely with businesses, residents and students to provide the education and services that keep Northeast Wisconsin strong.

Wisconsin's Technical Colleges were founded to train the workforce. In the early 1900s, most workers learned both job skills and academic skills from their apprenticeship employer. In order to standardize young workers' skills in reading, writing, and math, the State of Wisconsin promoted the creation of city vocational schools. Schools sprang up in Green Bay and Marinette in 1913, followed in 1941 by Sturgeon Bay, serving working boys and girls ages 14-18. The schools eventually grew to serve adults of all ages, whether or not they were employed or apprenticed. In 1968, the three schools joined to become a single district in the Wisconsin Technical College System, serving part or all of nine counties.

Today, NWTC offers over 70 associate degree and technical diploma programs, plus certificates, contracted business services, personal enrichment and continuing education. Due to increasing demand, the College has added 40 percent to its facilities District-wide and added 39 percent to its full-time-equivalent student count since 2001. Each year NWTC serves over 40,000 people as they enter the workforce, change careers, gain high-tech new skills, start a business, or meet personal or workplace goals.

## Education Where, When, and How Customers Want It

NWTC is committed to serving all learners, and every learner comes with different strengths, goals and needs. The College offers diverse learning opportunities to increase public access to education.

- Regional Learning Centers bring NWTC classes, basic education, employer services and student services to sites throughout Northeast Wisconsin.
- Corporate Training and Economic Development services, including contracted training and technical assistance, are offered District-wide, often at the employer's facility.
- Credit transfer agreements with the University of Wisconsin System and public and private colleges allow students to transfer NWTC credits into bachelor's degree programs, often saving money and travel time.

- Flexible Learning Options use technology, non-traditional scheduling, and innovative teaching techniques to enable more people to continue their education. Options include online, weekend, accelerated, self-paced and videotaped classes.
- Basic skills education can equip students for college entry, workplace academic needs, high school transcript, High School Equivalency Diploma (HSED) transcript, or General Education Development<sup>®</sup> (GED) Tests Certificate transcript, and personal enrichment.
- Short-term certificates, seminars, and workshops allow busy customers to gain precisely the information and skills they need.

Together, these flexible offerings allow more people to access education in traditional, new, and emerging technologies, serving all Northeast Wisconsin communities.

*\* GED<sup>®</sup> and GED Testing Service<sup>®</sup> are registered trademarks of the American Council on Education<sup>®</sup> and may not be used or reproduced without the express written permission of the American Council on Education.*

## Core Abilities

NWTC has identified core abilities that benefit all students, beyond the context of any specific course. The College supports the following skills for all graduates of NWTC:

- Communicate effectively
- Understand and appreciate diversity
- Demonstrate global awareness and sensitivity
- Work cooperatively
- Set and achieve goals
- Value self
- Model responsible behavior
- Learn effectively
- Apply relevant technologies
- Think critically and creatively
- Access and use appropriate information resources



Green Bay Campus

# District and Campus Information

## Green Bay Campus

2740 West Mason Street, P.O. Box 19042  
Green Bay, WI 54307-9042  
(920) 498-5400 or (800) 422-NWTC

NWTC-Green Bay is the main campus, featuring the District offices and specialized learning centers in business and information technology, health occupations, emergency response, construction, manufacturing and more.

As a result of Northeast Wisconsin's support of NWTC's 2001 referendum, several new buildings have been completed since 2001 to meet employers' need for additional high-skill workers and to allow area residents to pursue rewarding careers.

- The Health Sciences Center houses state-of-the-art equipment in nursing, dental, and allied health specialties. The newly-opened N.E.W. Clinic site at NWTC allows the College to admit more health sciences students, address the growing health care worker shortage and support health care for the uninsured.
- The Manufacturing Technology Center offers flexible space where students and area employees can work with interconnected electrical, electronic and mechanical systems. Both classroom and self-paced formats are available.
- The Student Center offers space for relaxation and learning, with a cyber-café, an expanded library, student services, the Book Store and cafeteria. It won a 2005 city beautification award from Green Bay civic leaders.
- The Business Assistance Center offers entrepreneurs training, support, counseling, information, and access to resources to assist in small business success. Eight partners, including NWTC, UW-Green Bay, the Chamber, SCORE, Urban Hope and more, all work collaboratively to help in planning and preparation.
- The new Landscape Horticulture Learning Center features one of the Midwest's few landscape construction labs. It opened in 2007 at the Green Bay Botanical Garden and won a 2007 city beautification award for environmental design.
- The Public Safety Training Center offers specialized training for police, firefighters, EMTs and other emergency responders. The Tactical Training Center allows multi-disciplinary, scenario-based training in a fully customized environment. The

Cinetronic Range helps police and corrections officers train in effective communications, tactics and least-force response. The three-story burn tower allows firefighters to practice fire-fighting and lifesaving techniques in blinding smoke and temperatures above 400 degrees.

The campus offers simple and convenient access from U.S. Hwy 41. It also is accessible by city bus and local taxi services, and is near Austin Straubel International Airport.

## Sturgeon Bay Campus

229 N 14th Avenue  
Sturgeon Bay, WI 54235-1317  
(920) 746-4900

The Sturgeon Bay campus is a 60,000 square foot facility in beautiful Door County, the Midwest's number one tourist destination. WW II saw the creation of a vocational school to serve the need for trained workers in the area's shipbuilding industry. The Diesel program began in 1961, while the Nursing program began in 2002. The first phase of the Sturgeon Bay campus was built in 1971. Subsequent additions in 1977, 1992, and 2003 have resulted in the current campus.

The campus offers **Complete** programs in:

- Diesel and Heavy Equipment Technician
- Diesel Equipment Technology
- Hotel and Restaurant Management
- Leadership Development
- Office Assistant
- Nursing Assistant
- Nursing-Associate Degree
- Practical Nursing
- Welding
- General Studies Transfer

The campus offers **the first year** of the following programs:

- Accounting
- Administrative Assistant
- Business Management
- Health Care Business Services
- Health Information Technology
- Marketing

The campus offers a full range of **Certificates** for those interested in developing specific technical skills. Many credits earned can be transferred into a related NWTC diploma or degree programs.

An advisor and counselor are available to the students on the Sturgeon Bay campus, providing career counseling, admissions information and assistance with school issues. The advisor and counselor work closely with Enrollment Services offices on the Green Bay campus to see that students are provided with a full range of services.

The campus has a student government that plans social activities and community services. Student activities include a blood drive, collecting food for the local food pantry, adopt-a highway, Habitat for Humanity, and campus wide social events.

The Diesel Club assists student government in sponsoring campus activities. The Diesel Club is involved in SkillsUSA and has a strong history of success at the national organization's competitions. The club takes overnight field trips to companies like Case/New Holland and Caterpillar.

Basic Education is offered through a lab setting, with morning, afternoon, and evening hours. The lab classes can help students prepare for college, succeed in classes, or earn an HSED or General Education Development® (GED) Tests transcript.



Sturgeon Bay Campus

# District and Campus Information

## Marinette Campus

1601 University Drive  
Marinette, WI 54143  
(715) 735-9361

NWTC-Marinette is located on the south edge of the city of Marinette. Situated on the waters of Green Bay, the city is a hub of recreation, industry, and retail. Marinette and its sister cities of Peshtigo and Menominee, Michigan, jointly offer citizens a wealth of diverse social and economic opportunities. In August 2002, construction was completed on a 23,000 square foot addition to the campus. This addition, as well as other significant remodeling to the Marinette campus, focuses on community needs in the areas of health sciences, trades and technical, and business and information technology.

In the summer of 1999, the construction of a Wisconsin Job Center was completed on the Marinette campus. The Marinette Job Center offers job placement services, career development and planning, and guidance on occupational education and training opportunities.

The Marinette campus is a full service campus offering a variety of full- and part-time programs, plus convenient scheduling options for students with diverse needs:

- Associate degree program in Fire Protection Engineering Technology, which was developed as a result of a unique industrial base in the Marinette area.
- Associate degree programs in Applied Engineering, Computer Support Specialist, Accounting, Automotive Technology, Administrative Assistant, Leadership Development, and Nursing.

- Technical diploma programs in Practical Nursing, Machine Tool Technics (Tool & Die Making), Automotive Technician, Computer Support Technician, Office Assistant, Welding, Nursing Assistant, and Emergency Medical Technician-Basic.
- Certificate programs are available in General Studies, Supervision, Electrical and Mechanical Maintenance, Medical Transcription and Coding, Computer Aided Drafting, Child Care, Software, APICS certification and many more.
- Convenient, flexible learning options: evening classes and programs, weekend college, certificates, self-paced learning, accelerated learning, Technical College of the Air, Interactive Television, and online learning.

Services at the Marinette campus include a full Career Center; learning labs providing support with math, reading and study skills; Returning Adult Services; Special Needs Services; career assessment, counseling, and admissions. An active Student Senate and program-related clubs provide high quality extra-curricular activities.



Marinette Campus

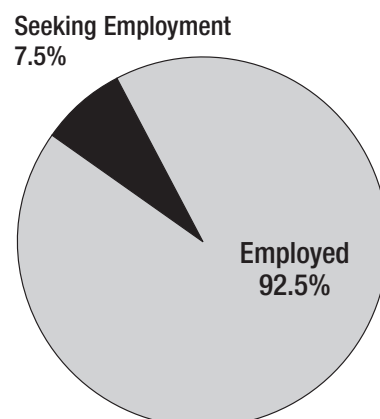
## Corporate Training and Economic Development

The NWTC Corporate Training and Economic Development department provides customized, flexible, cost-effective and convenient training to more than 1,100 businesses throughout the District annually—allowing them to achieve and maintain peak efficiency in the global marketplace. Corporate Training and Economic Development trains today's employees for the skills of tomorrow with entry-level to advanced training, international services, seminars and technical assistance.

For more information, call (920) 498-6911; (800) 422-NWTC, extension 6911; or <http://corporatetraining.nwtc.edu>

## Associate Degree and Technical Diploma Programs

Of those 2008 Graduates available for employment,  
77.5% are working in jobs related to their chosen career field.





# District and Campus Information

## NWTC Regional Learning Centers

From Florence to Wrightstown, Bonduel to Kewaunee, district residents are taking advantage of the learning opportunities provided by NWTC's Regional Learning Centers. With five center locations and extended outreach offerings to 30 communities, busy adults can get an excellent education, update their skills, change careers, and enrich their lives – without the long commute.

The Regional Centers are 5,000-square-foot-facilities equipped and staffed to provide credit and non-credit opportunities close to home. They offer a wide range of programs, courses and services, including:

- Registration and bookstore services.
- English Language Learner classes.
- Adult Basic Education classes.
- Preparation for High School Equivalency Diploma (HSED) transcript, or General Education Development® (GED) Tests Certificate transcript.
- Corporate Training and Economic Development for area businesses.
- Credit and non-credit computer classes.
- Certificates and seminars.
- Credit level courses – general education, program specific, and pre-program courses.
- Academic Advising available onsite for assistance with career selection, applications, and financial aid.
- Certification and re-certification courses like Responsible Beverage Server, CPR, and Food Service Sanitation.
- Assessment testing.
- Access to computers, video equipment and tape checkout to support on-line, video and self-paced courses.

All of the Regional Learning Centers offer video conference classrooms, large classrooms with SmartBoard Technology, computer labs, free high speed wireless access, student study areas with computers, office/reception areas, and adult skills classrooms.

The Regional Learning Centers cover the gamut of college services for potential and current students. When students want help with choosing a program, assessment, scheduling, registration, financial aid or tuition processing, the Regional Learning Centers are ready and convenient. All staff work closely with the campuses to see that students receive the assistance and services they need.

Business training services for local companies are also hosted at the Regional Learning Centers. Seminars and customized training programs in the facilities bring quality employee education to local businesses. From Customer Service and Conflict Resolution to Excel and Leadership Development, the Regional Learning Centers offer opportunities for learning and continued career development.



District Map by Region

## Regional Learning Center Locations

### Central Region

Vicky Oldham, Regional Coordinator  
418 South Hwy 141  
Crivitz, WI 54114  
Phone: (715) 854-3338  
Toll Free: (866) 854-3338  
Fax: (715) 854-3799  
E-mail: central@nwtc.edu

### North Region

Sally Miller, Regional Coordinator  
705 Washington Avenue  
P.O. Box 226  
Niagara, WI 54151  
Phone: (715) 251-3790  
Toll Free: (866) 528-5883  
Fax: (715) 251-4621  
E-mail: north@nwtc.edu

### East Region

Sarah Nelson, Regional Coordinator  
133 Commerce Drive  
Luxemburg, WI 54217  
Phone: (920) 845-5945  
Toll Free: (866) 845-5945  
Fax: (920) 845-5948  
E-mail: east@nwtc.edu

### West Region

Debbie Kuhn, Interim Regional Coordinator  
111 Thomas Avenue  
Shawano, WI 54166  
Phone: (715) 524-2418  
Toll Free: (877) 316-1274  
Fax: (715) 524-8770  
E-mail: west@nwtc.edu

### Northwest Region

April Konitzer, Regional Coordinator  
649 E. Jackson Street  
Oconto Falls, WI 54154  
Phone: (920) 848-6982  
Toll Free: (866) 639-6982  
Fax: (920) 848-7773  
E-mail: northwest@nwtc.edu

### Metro Region

Donna Meves, Regional Coordinator  
NWTC-Green Bay Campus  
2740 W. Mason Street  
P.O. Box 19042  
Green Bay, WI 54307  
Phone: (920) 498-6872  
Toll Free: (800) 422-6982, extension 6872  
Fax: (920) 491-3799  
E-mail: metro@nwtc.edu

# District and Campus Information

## District Description

### District Boundaries

The Northeast Wisconsin Technical College District is officially described as follows: Brown County less the portions of the Brillion Public School District and the Kaukauna Area School District; Door, Kewaunee, Oconto, Florence, and Marinette Counties; plus the portion of the School District of Denmark in Manitowoc County, and the portion of the School District of West De Pere in Outagamie County; the Gillett School District, the School District of Bonduel, and the Shawano-Gresham School District in Shawano County; and the Pulaski Community School District in Outagamie and Shawano Counties.

This catalog is not to be considered in any way a contractual document between Northeast Wisconsin Technical College and the student. The District administration reserves the right to change curricula, regulations, and course offerings as published in this catalog during the period of any student's attendance. Any changes made will be in accordance with the policies, rules, and regulations established by the Wisconsin Technical College System Board and will be based upon the changing needs of the occupational areas involved.

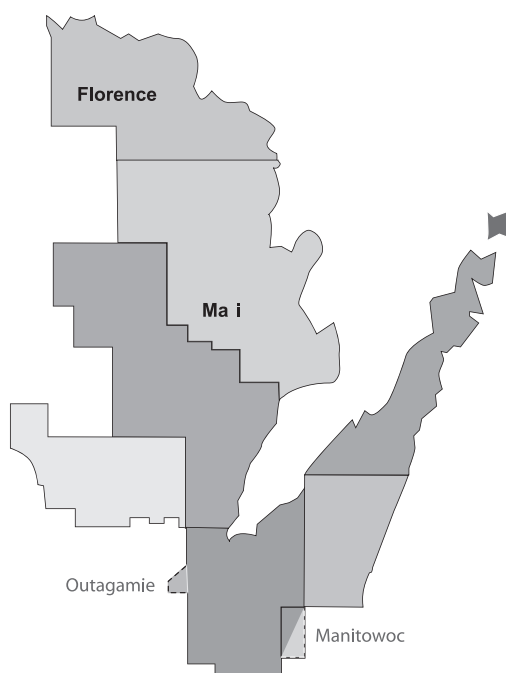
This catalog was designed for individuals interested in enrolling in post-secondary associate degree and technical diploma programs at Northeast Wisconsin Technical College during the 2009-10 school year. Programs in higher education are offered at three campuses: Green Bay, Marinette, and Sturgeon Bay. In addition, a network of Regional Learning Centers provides learning opportunities throughout the District.

District policy changes after January 1, 2010, could affect portions of this catalog.

### Accreditation of Programs

Northeast Wisconsin Technical College is accredited by the Higher Learning Commission and is a member of the North Central Association, [www.ncahlc.org](http://www.ncahlc.org). It is recognized as an institution of higher education by the United States Department of Education. It is recognized as a comprehensive technical college by the Wisconsin Technical College System Board.

The State of Wisconsin empowered the NWTC District Board in 1960 to grant Associate Degrees in Applied Science in two-year programs and Technical Diplomas in one- and two-year programs. Acceptance of courses for transfer credit at the baccalaureate level is at the discretion of the receiving institution.



District Map by County

Students may apply online using the **my.NWTC** Student Self-Service portal. Go to **www.nwtc.edu** and click on **my.NWTC** for details.

# Admission

## Applications

Applications to enter an associate degree or technical diploma program are accepted from students who have, at least, entered their senior year in high school. To apply online, go to **www.nwtc.edu** and click on **my.NWTC**. Paper applications are available through local high school counselors, from the Welcome Center at any NWTC campus or center, or by calling Enrollment Services at (800) 422-NWTC, extension 5444.

NWTC begins accepting applications the Monday after Labor Day. Completed applications are processed on a first-come, first-served basis. When enough applications to fill the next entry date and establish an adequate waiting list have been received, the program is closed and applications are no longer accepted. The closing date varies from program to program and is not entirely predictable. In some cases, a program may not be closed at all.

*Note: The following programs have only a five-day application period starting the Monday after Labor Day: Dental Hygienist, Diagnostic Medical Sonography, Radiography, and the full-time Nursing-Associate Degree in Green Bay. (The part-time ADN program and other locations accept applications until the programs fill.)*

Call Enrollment Services at (800) 422-NWTC, extension 5444, for more specific information.

## Application Process

Applying to the program of your choice is easier than ever. You can apply on the web or on paper, and be on your way to a quality education and a great job!

### Online:

1. Go to **www.nwtc.edu**
2. Click on **my.NWTC**
3. Follow the Login instructions. You will need your Social Security Number and credit card.

### By Mail or in Person:

You will need

1. A completed application
2. A one-time, non-refundable \$30 application fee (No cash by mail, please)
3. Your high school transcript or equivalent
4. Transcripts from any college you may have attended

*(NOTE: You may ask the institutions you attended to send the transcripts directly to NWTC-Program Enrollment.)*

Mail to NWTC Program Enrollment, P.O. Box 19042, 2740 W. Mason Street, Green Bay, WI 54307-9042 or bring to the Welcome Center at NWTC-Green Bay, or any NWTC campus or Regional Learning Center.

### NWTC-Program Enrollment will:

1. Send an acknowledgement letter to you within five working days of receipt of your application.
2. Provide written information to you about the status of your application with instructions on what to do next.

You may contact NWTC-Enrollment Services at any time during the application process at (800) 422-NWTC, extension 5444, or (920) 498-6901 for TTY Access.

### Waiting List

NWTC is in compliance with Wisconsin Statute TCS10, which specifically addresses the use of Waiting Lists. When enough applications have been received, processed, and accepted to fill a program for that term, a Waiting List is established.

Applications will continue to be processed and placed on a Waiting List until enough applicants are on a Waiting List to fill that program for the following term. The program will then be "closed" to further applications until the following term.

### Admission Questions

For questions regarding admission to an NWTC program, students should contact Enrollment Services, (800) 422-NWTC, extension 5444, for their desired degree or diploma program.

The admission process includes an Academic Skills Assessment (page 11).

### Student Classification System

There are three classifications of students at NWTC.

- Program students (associate degree and technical diploma)
- Certificate students (students pursuing one or more short-term certificates)
- Undeclared students (students not yet accepted into an associate degree or technical diploma program)

### Associate Degree and Technical Diploma Students must:

- Apply and be admitted to a degree or diploma program
- Successfully complete all required course work and prerequisites to graduate
- Have at least a 2.0 (C) cumulative grade point average (GPA) to graduate
- Fulfill requirements as stated in the Student Handbook
- Attend a program orientation
- Register prior to undeclared and certificate students

### Undeclared and Certificate Students May:

- Take available classes that meet their personal objectives and for which they have completed the prerequisites
- Not have applied for admission to any degree or diploma program
- Not have been accepted into a degree or diploma program

### New Students

An applicant must be a high school graduate or equivalent to be eligible for admission to all programs. Upon application, Program Enrollment will evaluate all experience, transcripts and assessments to determine that program requirements have been met. All records, including assessment results (Academic Skills Assessment Program Benchmark Scores, pages 12-13) are considered by Program Enrollment when granting acceptance to a degree or diploma program.

### Transfer Students

Students transferring to NWTC from another institution of higher education will be considered for admission based on all submitted records. If an applicant is on scholastic suspension at another institution, she/he will be considered for admission on a conditional basis.

### Negative Service Indicators

Negative service indicators are holds placed on student records that block activities such as registration. Applications will not be accepted from students who have negative service indicators. Students are welcome to reapply after the indicators have been satisfied and removed. For more information on indicators, contact the Student Finance Office at (920) 498-6816.

### Readmission

If a student's attendance is interrupted for three or more consecutive semesters, the student must reapply and see a counselor before re-enrolling. Written notice will be sent to the student regarding reapplication options.

An exception is made for students serving in the military reserves or Wisconsin National Guard who have their attendance interrupted due to call to active military service or who are asked to work for the federal government during a national emergency or limited national emergency.

# Admission

## International, Nonimmigrant Student Admission

The U. S. Department of Justice, Immigration and Naturalization Service (INS) has approved NWTC for acceptance of international, nonimmigrant students.

International students who have not taken the Academic Skills Assessment must have scored well enough on another approved standardized test within three years of applying for admission to an NWTC program. The test must assess reading, writing, and arithmetic skills. Other approved tests are: TOEFL, ACT, ASSET, TABE, Compass, or Accuplacer tests. For more information, contact the NWTC Registrar, (920) 498-6269.

## Tuition and Fees

Tuition and fees for a typical class (credit-bearing lecture class delivered in a classroom) are \$107.30 per credit in 2008-09, not including books or other supplies. Fees vary depending on type of class (lab, clinical, non-credit, or on-line) and degree program. Non-resident tuition is an additional \$497.20 per credit. See next column for Minnesota and Michigan reciprocity agreements.

An estimate of each semester's program cost for each degree program is online. The Wisconsin Technical College System Board will set fees for 2009-10 after this publication goes to press; for more specific cost information, please visit **my.NWTC** or contact the Student Finance Office at (920) 498-6816 or (800) 422-NWTC, extension 6816.

## Refund Policy

The Wisconsin Technical College System (WTCS) Refund Policy states:

- Drop before the first scheduled meeting of the class.....100% refund
- If at or less than 10% of total class meetings completed at time of drop.....80% refund
- After more than 10% but not more than 20% of total class meetings completed at time of drop.....60% refund
- After more than 20% of total class meetings completed at time of drop.....0% refund

After the first scheduled day of class:

Miscellaneous class-related fees (i.e. luncheon, insurance, etc.) are non-refundable.

You may drop a class in several ways: through the **my.NWTC** web portal at **www.nwtc.edu**; by phone at (920) 498-5444 or (800) 422-NWTC, extension 5444; or in person at the Welcome Center at any NWTC location.

For complete refund information, please visit our Web site at **www.nwtc.edu** or call (920) 498-6816 or (800) 422-NWTC, ext. 6816.

## Tuition Reciprocity Agreements

### Michigan-Wisconsin Post-High School Wisconsin Technical College System Reciprocity Agreement

Any Wisconsin student who is a resident of the Northeast Wisconsin Technical College District may attend any of the following schools in Michigan: BayDeNoc and Gogebic Community Colleges and educational institutions in the counties of Gogebic, Iron, Dickinson, Menominee, and Delta. The student will pay the standard out-of-district resident tuition rate charged by that institution under this agreement.

Any Michigan student who is a resident of BayDeNoc and Gogebic Community College Districts in the counties of Gogebic, Iron, Dickinson, Menominee, and Delta may attend NWTC. Students admitted under this agreement will pay an additional nominal fee.

In 2008-2009 this fee was \$5.00 per credit. Students from both states shall be charged the same standard out-of-district, in-state, resident tuition rate. The tuition rate is established annually by mutual agreement of representatives of each state and the educational districts involved.

### Minnesota-Wisconsin Interstate Compact

A Wisconsin resident enrolled in a full-time program in a Minnesota Vocational-Technical Institute is considered a Minnesota resident for tuition purposes. A Minnesota resident enrolled in a full-time program at NWTC is considered a Wisconsin resident for tuition purposes.

## Tobacco-Free Campuses

The use of tobacco products are prohibited within the Northeast Wisconsin Technical College facilities at the Green Bay, Marinette, and Sturgeon Bay campuses. The Northeast Wisconsin Technical College District Board instituted this policy based on a concern for the health of all students, faculty, and staff members at the College.

## Retraining Guarantee

NWTC offers free retraining for employed graduates whose employer certifies that they lack job competencies specified in their degree or diploma program.

Former students are eligible if they meet three requirements.

1. The NWTC student has graduated from a one-year or two-year technical diploma or associate degree program.
2. The job concerned is the student's first job after graduating.
3. Within 90 days of hiring the graduate, the employer certifies in writing that the employee lacks entry-level job skills and specifies the areas in which the graduate is deficient.

When these conditions are met, an NWTC team will be assembled to help the student with retraining courses and services. Participants may take up to six credits in their occupational program, and all program and material fees will be covered by the College.

Students are fully responsible for tuition and fees. To avoid charges, late fees, and collection activities, students must pay class fees by the due date, or must drop any classes through Enrollment Services. Students will not be automatically dropped from classes by simply not attending.



# Academic Skills Assessment Information

NWTC is committed to assisting all students in meeting their service and learning goals. NWTC uses an Academic Skills Assessment to determine entry-level program readiness.

All students entering an associate degree or technical diploma program must complete an Academic Skills Assessment as part of their admissions process **except:**

Applicants who have a diploma from an accredited four-year college or university or an associate degree from a Wisconsin Technical College.

OR

Applicants who have earned sixteen college credits within the past three years and have earned an average of “C” or better. (Not applicable to associate degree programs listed in the next column.)

OR

Applicants who have scored well enough on an approved standardized test within three years of applying to an NWTC program. The assessment must include reading, writing, math, and algebra (if applicable) skill components.

Approved standardized tests are:

- Accuplacer Skills Assessment
- ACT from American College Testing Service
- Asset
- Compass
- TABE

Students who do not have a high school diploma, or General Education Development® (GED) Tests transcript, or HSED will also need to attain certain minimum test scores in order to receive federal financial aid.

## Academic Skills Assessments

The Academic Skills Assessment assesses the candidate’s skill level in the areas of reading comprehension, sentence skills, math, and algebra, identifying the content areas that may need skill improvement to ensure the candidate’s program success.

The Academic Skills Assessments are taken on a computer. Assessment scores are provided immediately upon completion of the assessment.

## Program Benchmarks and Program Admission

The Program Benchmark Scores (pages 12-13) list active programs and their benchmark scores. Several programs require program benchmark scores or minimum composite ACT scores be met either prior to submitting a program application or prior to program entry.

The following programs require assessment scores be met **prior to submitting an application.** If ACT test scores are submitted, the required composite scores for the programs are:

Program	ACT Composite Score
Associate Degree Nursing .....	22
Diagnostic Medical Sonography .....	20
Practical Nursing .....	18
Radiography .....	20

The following programs require assessment scores be met **prior to program entry.** If ACT test scores are submitted, the required composite scores for the programs are:

Program	ACT Composite Score
Clinical Lab Technician .....	20
Dental Assistant .....	14
Dental Hygiene .....	20
Medical Assistant .....	14
Paralegal .....	18
Physical Therapist Assistant .....	20
Respiratory Therapist .....	20
Surgical Technologist .....	14

Accuplacer and TABE program benchmark scores are given on the following pages.

Detailed information regarding application and admission requirements for these programs can be found on the respective program description pages of this catalog (pages 34-189).

The remaining NWTC programs do not require that program benchmarks be met in order to be accepted into an NWTC program. However, candidates are strongly encouraged to improve their skills and meet the program benchmarks prior to program entry. In some cases, upgrading of skills can be done simultaneously with program coursework.

Individuals not meeting the benchmarks listed next to their program of choice (pages 12-13, Academic Skills Assessment/Program Benchmark Scores) can still be admitted into the program of their choice **if:**

- 1) The learner meets the “College Minimum Standards” as follows: Math 34/8.8; Reading Comprehension 55/8.3; Language 60/7.8.
- 2) The learner works to upgrade the content area identified as needing improvement. For students who have completed high school, skill improvement may be done at NWTC’s on-campus Academic Skills Lab, or at any of NWTC’s Regional Learning Centers.
- 3) The learner’s program of choice is not listed as a program that requires assessment scores be met prior to submitting application or prior to program entry.
- 4) The learner meets other non-assessment criteria required by the program.

## Assessment Center Location and Hours

The Academic Skills Assessments are administered at the NWTC-Green Bay Campus Assessment Center, Room SC 365, on a walk-in basis during the following hours:

### Monday - Thursday

8:00 a.m. – 7:00 p.m.  
Please arrive by 4:00 p.m.

### Friday

8:00 a.m. – 5:00 p.m.  
Please arrive by 2:00 p.m.

### Saturday

8:00 a.m. – 11:00 a.m.  
Please arrive by 8:00 a.m.

**Note:** Summer Hours may vary

**The Academic Skills Assessments are also given at the following locations:**

**Sturgeon Bay** – Serving Northern Door, Sturgeon Bay, Sevastopol, and Washington Island. Call (920) 746-4900; toll-free (800) 422-6982, extension 4900.

**Marinette** – Serving Marinette and Peshtigo. Call (715) 735-9361; toll-free (800) 422-6982, extension 9361.

**Central Region** – Serving Coleman, Crivitz, Lena, Oconto, Wausaukee, and parts of Marinette. Call (715) 854-3338; toll-free (866) 854-3338.

**East Region** – Serving Algoma, Casco, Denmark, Kewaunee, and Luxemburg. Call (920) 845-5945; toll-free (866) 845-5945.

**North Region** – Serving Aurora, Florence, Goodman, Niagara, Pembine, and Tipler. Call (715) 521-3790; toll-free (866) 528-5883.

**Northwest Region** – Serving Gillett, Lakewood, Townsend, Oconto Falls, and Suring. Call (920) 848-6982; toll-free (866) 639-6982.

**West Region** – Serving Shawano, Bonduel, and Pulaski. Call (715) 524-2418; toll-free (877) 316-1274.

Please contact the above sites to inquire about their specific schedules.

**Important! Picture identification and a \$20.00 fee are required to take all Academic Skills Assessments.**

Any questions regarding the **Academic Skills Assessment** process should be directed to Sally Langan, NWTC-Green Bay Assessment Center, at (920) 498-5688, (800) 422-NWTC, extension 5688, or e-mail: [sally.langan@nwtc.edu](mailto:sally.langan@nwtc.edu)

# Academic Skills Assessment Information

Listed below are the benchmark grade equivalents for each NWTC program. The benchmarks represent the entry skill level considered necessary for a student to be successful in that program. Students not meeting the benchmark grade equivalents in the program of their choice have the opportunity to prepare for program entry by attending NWTC's on-campus Academic Skills Labs or any one of the Regional Learning Centers. Instruction is individualized, self-paced, and offered at no cost to the learner.

Program Code	Program Name	Accuplacer				TABE		
		Reading Comp	Arithmetic	Sentence Skills	CLM/ Algebra	Reading	Math	Language
101011	Accounting	75	66	87	N/A	10.6	10.3	10.9
101066	Administrative Assistant	66	41	76	N/A	8.6	9	10
106237	Applied Engineering Technology	90	66	74	86	12.9	10.3	8.9
106141	Architectural Technology	88	90	90	CM-50	12	12	12
104051	Auto Collision Repair & Refinish Technology	68	55	73	N/A	9	9.8	8.3
324051	Auto Collision Repair & Refinishing Technician	68	55	73	N/A	9	9.8	8.3
106641	Automation Engineering Technology	79	101	89	CM-50	10.9	12.9	11.5
324042	Automotive Technician	75	41	73	N/A	10.6	9	8.3
106023	Automotive Technology	75	41	73	N/A	10.6	9	8.3
101023	Business Management	55	34	60	N/A	8.3	8.8	7.8
101097	Casino Management	55	34	60	N/A	8.3	8.8	7.8
106071	Civil Engineering Technology	79	101	84	CM-63	10.9	12.9	10.4
105131	Clinical Laboratory Technician	90	101	94	60	12.9	12.9	12.9
101543	Computer Support Specialist (IT)	95	66	89	86	12.9+	10.3	11.5
311546	Computer Support Technician (IT)	95	66	89	86	12.9+	10.3	11.5
101145	Credit Business Management	68	34	60	N/A	9	8.8	7.8
105042	Criminal Justice-Corrections	55	34	60	N/A	8.3	8.8	7.8
105041	Criminal Justice-Law Enforcement	55	34	60	N/A	8.3	8.8	7.8
305041	Criminal Justice Law Enforcement Academy	75	66	95	N/A	10.6	10.3	12.9+
315081	Dental Assistant	75	66	84	N/A	10.6	10.3	10.4
105081	Dental Hygienist	90	80	90	60	12.9	11.3	12.1
105262	Diagnostic Medical Sonography	90	70	84	60	12.9	10.7	10.4
324121	Diesel & Heavy Equipment Technician	55	41	60	N/A	8.3	9	7.8
104121	Diesel Equipment Technology	55	41	60	N/A	8.3	9	7.8
102065	Digital Media Technology	75	51	84	N/A	10.6	9.4	10.4
101353	E-Business Technology Specialist	75	51	84	86	10.6	9.4	10.4
103071	Early Childhood Education	75	55	73	N/A	10.6	9.8	8.3
106621	Electrical Engineering Technology	79	101	89	CM-63	10.9	12.9	11.5
314132	Electrical Power Distribution	86	66	84	54	11.3	10.3	10.4
314131	Electricity	55	34	60	46	8.3	8.8	7.8
106201	Electro Mechanical Technology	79	101	89	CM-63	10.9	12.9	11.5
106051	Electronics/Biomedical Engineering	79	101	89	CM-63	10.9	12.9	11.5
305313	Paramedic-Emergency Medical Technician Basic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
305316	Paramedic-Emergency Medical Technician I.V.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300901	Farm Business & Production Management	55	34	60	N/A	8.3	8.8	7.8
101144	Financial Institutions Management	68	34	60	N/A	9	8.8	7.8
105033	Fire Protection Engineering Technology	55	34	60	N/A	8.3	8.8	7.8
314692	Gas Utility Construction and Service	86	66	84	54	11.3	10.3	10.4
108001	General Studies Transfer	64	55	74	N/A	10	10	10

# Academic Skills Assessment

## Program Benchmark Scores

Listed below are the benchmark grade equivalents for each NWTC program. The benchmarks represent the entry skill level considered necessary for a student to be successful in that program. Students not meeting the benchmark grade equivalents in the program of their choice have the opportunity to prepare for program entry by attending NWTC's on-campus Academic Skills Labs or any one of the Regional Learning Centers. Instruction is individualized, self-paced, and offered at no cost to the learner.

Program Code	Program Name	Accuplacer				TABE		
		Reading Comp	Arithmetic	Sentence Skills	CLM/Algebra	Reading	Math	Language
101601	Health Care Business Services	75	72	84	N/A	10.6	10.9	10.4
105301	Health Information Technology	75	72	84	N/A	10.6	10.9	10.4
106011	Heating, Ventilation, Air Conditioning & Refrigeration Technology	70	55	65	34	9.8	10	7.9
101092	Hotel & Restaurant Management	55	34	60	N/A	8.3	8.8	7.8
108251	Individualized Technical Studies	55	34	60	N/A	8.3	8.8	7.8
104995	Individualized Technical Studies-Journeyworker	55	34	60	N/A	8.3	8.8	7.8
314622	Industrial Mechanic	55	41	60	N/A	8.3	9	7.8
105222	Instructional Assistant-Advanced	75	55	73	N/A	10.6	9.8	8.3
314411	Jewelry Repair & Fabrication	75	55	60	N/A	10.6	9.8	7.8
100014	Landscape Horticulture	66	72	89	N/A	8.6	10.9	11.5
101961	Leadership Development	55	34	60	N/A	8.3	8.8	7.8
324441	Machine Tool - CNC Technician	75	66	60	N/A	10.6	10.3	7.8
314201	Machine Tool Operation	75	66	60	N/A	10.6	10.3	7.8
324205	Machine Tooling Technics (Tool & Die Making)	75	69	60	N/A	10.6	10.5	7.8
106233	Manufacturing Engineering Technology	71	101	76	UW Math	9.8	12.9	9.8
101043	Marketing	55	34	60	N/A	8.3	8.8	7.8
101117	Marketing & Graphic Communications	75	51	84	N/A	10.6	9.4	10.4
106061	Mechanical Design Technician	75	96	84	CM-50	10.6	12.8	10.4
315091	Medical Assistant	55	34	60	N/A	8.3	8.8	7.8
101097	Casino Management	55	34	60	N/A	8.3	8.8	7.8
101502	Network Specialist-IT	95	66	89	86	12.9+	10.3	11.5
305431	Nursing Assistant	55	N/A	N/A	N/A	8.3	N/A	N/A
105431	Nursing-Associate Degree	90	80	95	N/A	12.9	11.3	12.9
311061	Office Assistant	66	41	76	N/A	8.6	9	10
101101	Paralegal	75	66	95	N/A	10.6	10.3	12.9+
305312	Paramedic-Emergency Medical Technician	N/A	N/A	N/A	N/A	N/A	N/A	N/A
105241	Physical Therapist Assistant	90	90	94	60	12.9	12	12.9
304281	Power Engineer & Boiler Operator	55	34	60	N/A	8.3	8.8	7.8
315431	Practical Nursing	78	79	90	N/A	10.8	11.2	12.1
312041	Print Technology	75	51	84	N/A	10.6	9.4	10.4
106142	Prototype & Design	79	70	76	68	10.9	10.7	10
105261	Radiography	90	90	94	65	12.9	12	12.9
105151	Respiratory Therapist	90	90	94	60	12.9	12	12.9
101821	Supply Chain Management	55	34	60	N/A	8.3	8.8	7.8
315121	Surgical Technologist	55	34	74	N/A	8.3	8.8	8.8
104681	Utilities Engineering Technology	79	101	89	CM-63	10.9	12.9	11.5
314421	Welding	55	41	60	N/A	8.3	9	7.8
314102	Wood Technics	71	72	73	N/A	9.8	10.9	8.3

# Credit for Prior Learning

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Thank you for considering enrollment at NWTC. Each year students enter the College who may have acquired some of the skills, knowledge and competencies needed for the courses or programs in which they are interested. Students are encouraged to review the following policies for awarding credit for prior learning to determine if any would be beneficial.

## Policy on Credit for Prior Learning

The College recognizes that skills and knowledge may be gained in ways other than through formal classroom or laboratory learning. Students must be officially admitted in a degree, diploma, or certificate program before receiving credit for prior learning. A minimum of 25 percent of the technical or occupational course requirements must be taken through NWTC.

### 1. Credit by Secondary School Written Agreement

Students may request credit for prior learning through written agreements between NWTC and accredited high schools in the District. NWTC also honors credit for prior learning agreements between secondary schools and other technical colleges in Wisconsin. Go to [www.nwtc.edu](http://www.nwtc.edu) and type **High School Transfers** in the search box to view the NWTC high school transfer agreements. Students may be awarded credit under the following conditions:

- The student presents appropriate documentation of successful completion of the course(s); and
- The student achieved at least a 3.0 (B) in the course(s).

### 2. Credit for Youth Apprenticeship Program

A student who has completed a state approved youth apprenticeship program may be awarded credit for a specific technical college course(s) under the following conditions:

- The student presents appropriate documentation of successful completion of the youth apprenticeship program; and
- The student achieved at least a 3.0 in youth apprenticeship course(s).

### 3. Credit for Prior Learning for Journey Level Apprenticeship Training

Apprentices who have completed their training and obtained journey level status are eligible for 32 credits for prior learning toward an associate degree in Individualized Technical Studies. For information, call the Apprentice Coordinator at (920) 498-5704 or (800) 422-NWTC, extension 5704.

### 4. Credit by NWTC Exam

A student may be granted credit for a specific technical college course(s) by demonstrating competency based on methods determined by the appropriate academic team. The assessment may consist of a performance exam, practical exam, or a combination of methods chosen by the academic team.\*

This procedure does not apply to standards, qualifications or license required by an agency outside the college.

**\* Please see the online Student Handbook for complete details. Go to [www.nwtc.edu](http://www.nwtc.edu)**

### 5. Credit by National Exam

A student may be granted credit for specific technical college course(s) by receiving a minimally acceptable score on an examination with nationally recognized standards. National exams include, but are not limited to, the College Board Advanced Placement (AP) exams, the College-Level Examination Program (CLEP), and nationally recognized exams in specific occupational areas.

- In granting credit, the College considers the achievement of an acceptable score on the examination and the applicability of the knowledge, skills, and competencies measured by the examination as it relates to the educational program in which the student is enrolled.
- For AP Exams, a student must receive a score of three or above to be eligible for the awarding of credit for the completion of the appropriate college course(s).

### 6. Credit for Work or Life Experience

Students may be granted credit for previous work, life, and military experiences that are comparable in content and level with specific NWTC courses. Portfolio documentation will be required; assistance in developing a portfolio is available through the Green Bay campus Communication Skills Lab or a community Basic Skills Lab. Forms are available in each of these division offices: Business & Information Technology, Health Sciences, Trades & Technical, Public Safety, and General Studies.

### 7. Transfer of Credit From Other Colleges or Universities

To transfer credits from other colleges or universities to NWTC, students must be accepted in an associate degree, technical diploma or certificate program. Students must provide the NWTC Program Enrollment Specialist with their official transcripts and records of educational assessments. The NWTC Student Records Office reviews all requests for transfer of credit. Student Records may grant credit if the course content being transferred is equivalent, and 2.0 (C) or better grades (with some exceptions) were received.

### Appeal Procedure

Decisions involving the granting of prior learning credit may be appealed. All appeals must be in writing and addressed to the Vice President of Student Services at the Green Bay campus.



# Academic Transfer and Articulation

## Private/Public Colleges and Universities

### Start Your Four-Year Degree at NWTC!

The credits you earn at NWTC are valuable—many four-year colleges and universities accept credits from NWTC toward a bachelor's degree.

More and more NWTC students are continuing their education beyond an associate degree. NWTC has credit transfer arrangements, called articulation agreements, with UW institutions and other public and private four-year colleges that allow students to smoothly transfer their credits toward a bachelor's degree. Some articulation agreements link specific NWTC programs with specific majors; some grant two years of credit for all associate degrees toward any four-year program.

To determine the specific courses and number of credits that will transfer, students are encouraged to contact the four-year college or university to which they are interested in transferring. For a current list of articulation agreements, go to [www.nwtc.edu](http://www.nwtc.edu) and type **Articulation** in the search box.

### Academic Transfer

#### Frequently Asked Questions

#### 1. How do I know where my credits will transfer?

**Answer:** To find out how your credits will transfer to a college outside of Wisconsin or to a private college or university within Wisconsin, you will need to contact the college to which you wish to transfer. In some cases, you may need to apply or be admitted to the college or university before receiving an evaluation of your transfer courses.

To find out how your credits will transfer to a public college or university within Wisconsin, you can utilize the Transfer Information System (TIS) which includes the 26 campuses in the University of Wisconsin System, UW-Extension's Independent Learning courses, and the 16 districts within the Wisconsin Technical College System (WTCS).

<http://www.uwsa.edu/tis/will/index.shtml>

#### 2. Why can't I find information about all courses on TIS? How can I find transfer information about a course not listed on TIS?

**Answer:** There are several reasons why course information may be missing from TIS. They include:

- (a) The course is new to the campus.  
There may be a delay between the time a new course is added at a campus and when the transfer information appears in TIS.
- (b) The course is no longer offered at the campus.
- (c) The course is an upper level course. In some cases, UW campuses have provided only freshman/sophomore transfer course information to TIS.
- (d) TIS includes limited transfer information for occupational or technical courses offered at Wisconsin Technical College System campuses. Check the WTCS Transfer Agreements section of TIS to see if these courses transfer as part of a WTCS transfer agreement.

#### 3. What is General Education? Why is General Education important in transfer planning?

**Answer:** Every college requires students to satisfy a set of general requirements (in addition to requirements in their major) in order to graduate. General Education requirements (also known as Gen Ed, General Degree Requirements, GE and GER) may include basic student competency or proficiency requirements, such as English composition, mathematics, and foreign language. They also include distribution or breadth requirements in the arts, humanities, natural and social sciences as a foundation for specialization.

Different colleges have different general education requirements. The Gen Ed column on the TIS Transfer Report tells you how the transfer course may be used to satisfy General Education requirements at the "Transfer To" campus. You can also use the General Education Wizard section on TIS to find out what courses at NWTC transfer for General Education credit at another UW or WTCS campus.

#### 4. Who decides how courses will transfer?

**Answer:** Each college has different programs, program requirements and courses. Since the level of the coursework and the course content are different, each campus makes its own determination as to how transfer courses fit into its requirements. In most cases campus faculty members are responsible for deciding how a course transfers.

#### 5. If I use TIS to see how a course transfers today, for how long can I "count on" the course transferring as shown on the TIS report?

**Answer:** The transfer course information listed on the TIS Transfer Report is guaranteed for courses taken during the current or immediately succeeding semester and, when students choose to transfer, will "count" as indicated on the report. The transfer equivalencies listed in TIS are accurate but may satisfy different degree requirements depending upon the specific major or program. In addition, course revisions or changes in requirements may cause equivalencies to change. Therefore, it is the student's responsibility to (1) discuss specific circumstances with an advisor, (2) check TIS for periodic updates and (3) retain printed copies of dated TIS reports for the semester the course is taken to ensure documentation if questions arise upon transfer.

Any questions regarding **NWTC Academic Transfer and Articulation Agreements** should be directed to Anne Kamps, NWTC Dean of Learning Support Services and Program Development at (920) 498-6367, (800) 422-NWTC, extension 6367, or e-mail: [anne.kamps@nwtc.edu](mailto:anne.kamps@nwtc.edu)

# Financial Aid

## Objectives

Enrollment Services helps students reach their educational goals by eliminating financial barriers and providing financial assistance in alignment with the vision of NWTC.

Financial aid is available to students in financial need through loans, grants, and work study employment. Enrollment Services also provides information on other types of financial assistance, such as scholarships.

Students should apply for financial aid in the January before they will start school, or as soon after January as possible. They may apply for aid before they are accepted into a degree or diploma program. However, financial aid award notification is not sent to students until they have been accepted into a program.

## Eligibility

To be eligible for federal or state aid programs, students must:

- Have financial need
- Be accepted in an eligible program
- Be a U.S. citizen or an eligible non-citizen (permanent resident)
- Be a Wisconsin resident for state funds
- Be registered with the Selective Service if required to do so
- Not be in default on a student loan nor owe a repayment on a student grant
- Not be convicted of a drug offense while receiving student aid
- Maintain satisfactory progress, as defined by the College

## Enrollment Status is Based on the Number of Credits Being Taken

- Full-time = 12 or more credits
- 3/4 time = 9 - 11 credits
- Half-time = 6 - 8 credits

## Application Procedure

When students apply for financial aid, the earnings and savings of the student and his or her family are used to determine financial need. The application process includes several steps.

### A. New First-Year Students

1. Apply for a PIN number at [www.pin.ed.gov](http://www.pin.ed.gov) if student does not already have one.
2. Apply online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov)

3. Students will receive a Student Aid Report (SAR) from the Federal Processing Center within four weeks. Be sure that the information is correct. If corrections need to be made, inform the NWTC Financial Aid Office.
4. Provide all additional information the NWTC Financial Aid Office requests.
5. Based on the financial need and number of credits the student is taking, the NWTC Financial Aid Office will determine the amount of aid in grants, work study and loans the student is eligible to receive. An Award Notification will be sent to each student with this information when the student is accepted into a program.
6. Monitor your financial aid through [my.NWTC](http://my.NWTC) at [www.nwtc.edu](http://www.nwtc.edu)

### B. Continuing and Transfer Students

Complete renewal application online at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) or follow steps 1-6 above. Students must follow this procedure for each academic school year. The Financial Aid Application (FAFSA) is available in mid-January for the next school year.

## Types of Financial Aid

Students who complete the FAFSA are considered for a variety of programs:

### Federal Pell Grant

The Federal Pell Grant program gives a base of aid to which all other types of aid are added. Pell Grants are based on financial need and are pro-rated according to the student's enrollment status.

### Federal Work-Study (FWS)

This program provides employment to students attending school at least half time who have financial need. Work-study students are paid \$7.75 per hour. The typical work-study job is 10 to 16 hours per week. Jobs are available for off-campus as well as on-campus positions.

### Federal Supplemental Educational Opportunity Grant (FSEOG)

This grant is for students who have a large financial need. The student must be eligible for the Federal Pell Grant Program in order to receive a FSEOG.

### Wisconsin Higher Education Grant (WHEG)

To receive a WHEG, the student must be a Wisconsin resident attending a Wisconsin college at least half-time.

### Talent Incentive Program (TIP)

The Talent Incentive Program grant is run by the Wisconsin Higher Educational Aids Board. To be eligible, the student must be a resident of Wisconsin, be enrolled at least half time as a first year student, and show financial need in addition to other select criteria.

### Wisconsin Minority Grant

The Minority Grant program is run by the Wisconsin Higher Educational Aids Board. To be eligible, the student must be a Wisconsin resident, be enrolled at least half time, and demonstrate financial need in addition to other select criteria.

### Bureau of Indian Affairs (BIA) Grant

Native American students (with at least 1/4 Indian lineage) enrolled full time may receive aid from the Bureau of Indian Affairs. To be considered for this grant, students must contact their Tribal Education Office for an Indian Scholarship Application.

### Wisconsin Indian Assistance Grant (WIAG)

This grant is for Native American students who are Wisconsin residents attending a Wisconsin college. To be considered for this grant, students must complete an Indian Scholarship Application with their Tribal Education Office.

### Wisconsin Deaf/Blind Handicapped

Visually challenged or hearing impaired Wisconsin residents may qualify for a Grant for Handicapped Persons. These grants are run by the Wisconsin Higher Educational Aids Board and are based on financial need. To be considered for this grant, the student must contact the Wisconsin Higher Educational Aids Board in Madison, WI, at (608) 266-0888.

## Academic Competitiveness Grant (ACG)

A recent high school graduate who is eligible for a Pell Grant may be eligible for the Academic Competitiveness Grant (ACG). To be eligible, a student must have completed a rigorous course of study in high school (four years of English, three years of math with Algebra and above, three years of science with biology, chemistry and/or physics, three years of Social Studies, and one year foreign language, fine arts or technical education). The student must also be a U.S. citizen pursuing an associate degree full-time and maintain a 3.0 grade point average. The ACG is limited to the first two years of a student's post secondary education.

## Federal Family Education Loan Programs

### Federal Stafford Loan (FSL)

This program makes low-interest loans available through local lenders to students who have financial need and who are enrolled at least half-time. Enrollment Services certifies loans and gives students further direction to complete the application process. The student should not get an application from a lender.

### Federal Unsubsidized Stafford Loan (FUSL)

The FUSL Program makes low-interest loans available to students who may not have the financial need necessary for the FSL. The government does not subsidize this program, so the student is responsible for the interest on FUSL. Enrollment Services certifies loans to the maximum allowable amount per federal guidelines. The student should not pick up an application from a lender.

### Federal Parent Loans for Undergraduate Students (PLUS)

This program makes loans available to parents of dependent students. For details, go to [www.nwtc.edu](http://www.nwtc.edu) and type **Loan** in the search box.

### Alternative Student Loans

When students' financial need and/or cost of attendance exceeds their financial aid, alternative loans may be available as a last resort. Alternative loans may also be used to pay past-due balances or provide funding when a student is denied financial aid. To compare lender products, go to:

<http://www.mylenderlist.com/nwtc/Private/>

## Veteran Information

Veteran Services is located in Room SC240 in the Student Center on the Green Bay Campus. If you wish to use your Federal Veteran Educational Benefits, you must be accepted into a program, complete the required forms each semester and submit the necessary paperwork for certification. In an effort to provide sufficient time to establish an award, you should apply for veteran benefits at the same time you apply for admission to your program.

Assistance under federal veteran programs include:

- Chapter 30, Montgomery GI Bill (Active-Duty)
- Chapter 31, Disabled Veteran's Vocational Rehabilitation Program
- Chapter 35, Survivor/Dependents' Educational Assistance Program
- Chapter 1606, Selected Reserve GI Bill (Reserve and Guard)
- Chapter 1607, Reserve Education Assistant Program

Assistance under Wisconsin Veteran Education programs include:

- National Guard Tuition Grant
- Veterans Education Grant
- Retraining Grant
- WI GI Bill

For information on eligibility requirements for state benefits, contact your County Veteran Services Officer.

Veterans who wish to continue to receive benefits must maintain satisfactory academic progress (GPA 2.0) each semester. Students must notify Enrollment Services of drops or withdrawals to prevent potential overpayments.

Further information on Veteran Benefits can be obtained at the Welcome Center in the Student Center on the Green Bay Campus or online at [www.gibill.va.gov](http://www.gibill.va.gov) for Federal Benefits. For State Benefits go to <http://dva.state.wi.us>

For questions about Veteran educational benefits at NWTC, contact NWTC's Veteran Coordinator at (920) 498-6292 or (800) 422-6982, extension 6292.

# Scholarship Information

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Northeast Wisconsin Technical College  
*Educational Foundation Inc.*

## Why apply for NWTC Scholarships

Whether you are a high school student or a new or continuing student at Northeast Wisconsin Technical College, full or part-time, you can reduce your financial obligations by applying for scholarships available through the NWTC Foundation or other organizations.

- Scholarships provide an excellent way to fund tuition, books and other course related expenses.
- Scholarships can replace personal payments or financial aid payments which could result in a refund of such payments for your living expenses.
- Scholarships are awarded to students who demonstrate initiative, the desire and potential to succeed, academic progress, or financial need.
- The NWTC Foundation awards over \$150,000 in scholarships each year to students taking classes through NWTC.

## When to apply for NWTC Scholarships

- **Apply between March 1 and May 1 for Fall Semester**  
Awards issued Aug. 6 (start of fall semester)
- **Apply between Oct. 1 and Nov. 15 for Spring Semester**  
Awards issued Jan. 15 (start of spring semester)
- Applications are accepted and processed outside of these times on a referral basis only

## How to apply

There are over 200 scholarships available to current and future NWTC students through the NWTC Foundation.

- All you need do is complete the NWTC Foundation Scholarship Application form. For details, go to [www.nwtc.edu](http://www.nwtc.edu) and type **Scholarship** in the search box.
- Your application will be submitted to the scholarship review committees of all the scholarships that best match your qualifications.



## Local, regional and national organizations

Many other organizations also provide scholarship funding to NWTC students. NWTC students have received over \$200,000 from such organizations. Each organization has its own program with separate applications and deadlines. As a service to our students, this information is posted on the NWTC website. For details, go to [www.nwtc.edu](http://www.nwtc.edu) and type **Scholarship** in the search box.

**We wish you the best in your search for educational funding. Remember, we are here to assist you.**

\_\_\_\_\_ Please phone (920) 498-6914 if you have additional questions. \_\_\_\_\_

## Northeast Wisconsin Technical College Educational Foundation

The Northeast Wisconsin Technical College Educational Foundation is a public, non-profit corporation that was established to assist in supporting the mission of the College. The Foundation acts as an agent through which contributions are managed and distributed. Contributions to the Foundation are applied toward student scholarships, faculty development, equipment acquisition, and program enhancement.

## Donate online

Go to [www.nwtc.edu](http://www.nwtc.edu) and type **Scholarship** in the search box.

## Northeast Wisconsin Technical College Alumni Association

Alumni who are interested in staying involved with the College, meeting other graduates, and contributing to the education of other students should contact the NWTC College Advancement/Foundation office, (920) 498-5541, or (800) 422-NWTC, extension 5541.

Alumni who change their address or who need assistance with job search should call the College's Center for Careers and Student Employment Office at (920) 498-5528, or (800) 422-NWTC, extension 5528. (For more information about the College's Center for Careers and Student Employment Office, see page 24.)



# Youth Options

## What is Youth Options?

Youth Options is a program that opens the door to greater learning opportunities for qualified high school juniors and seniors. Students who are considering a technical career, or wishing to begin college early, will be interested in Youth Options. The program allows students to take post-secondary (college-level) courses at NWTC.

The student does not have to pay for a post-secondary course if the high school board determines the course is not comparable to a course offered by the high school. If approved by the high school board, the student will receive both high school and post-secondary credit for a successfully completed course.

## Who is Eligible for Youth Options?

The student who has completed the 10th grade; is in good academic standing; does not have a record of disciplinary problems, as determined by the high school; and does not meet the statutory definition of a “child-at-risk” may participate in the Youth Options program.

## How Do I Start?

Application forms are available from your high school’s counseling office or from NWTC.

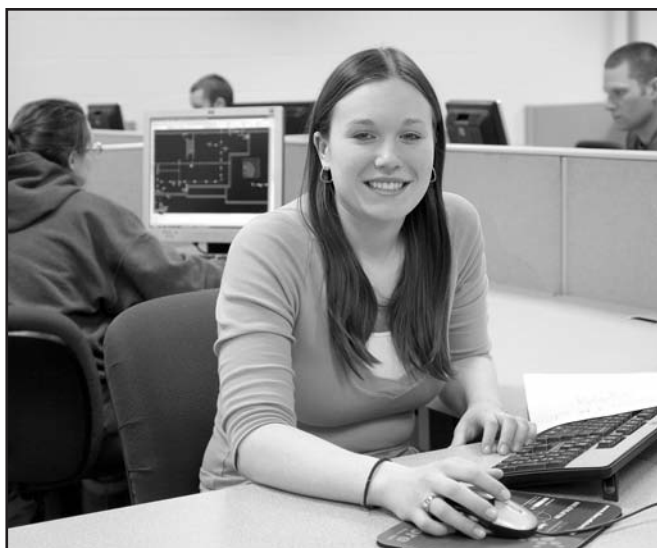
- The student must obtain his or her parent’s or guardian’s signature on the application.
- The student will then meet with the high school counselor to discuss how Youth Options classes will fit into the student’s high school schedule.
- With the assistance of the high school counselor, the student makes course selection(s) and submits those choices to the student’s school board by **March 1** for the fall semester or **October 1** for the spring semester.
- The signed forms with approved classes **MUST** be submitted to NWTC by the following dates: **May 15** for the fall semester or **November 15** for the spring semester.
- After the submission deadline, the student will be contacted by NWTC. Youth Options participants are required to meet with an NWTC representative prior to registration for the approved course(s).
- Courses offered during the summer session are not eligible for the Youth Options Program.

## What Courses are Available to a Youth Options Student?

A student will find many choices available. Courses are available in person, through Interactive Television (ITV), Technical College of the Air (TCA), and over the Internet. Any associate degree or technical diploma course may be taken, as long as all prerequisite and corequisite requirements are met.

The Youth Options Program is offered through the Green Bay, Marinette, and Sturgeon Bay campuses and all NWTC Regional Learning Centers.

For more information, call the Green Bay campus at (920) 498-5467 or (800) 422-NWTC, extension 5467.



# Flexible Learning Options



Flexible Learning Options (FLO) provide ways of taking courses at times and locations which go beyond the traditional college day. They are especially valuable for working adults who need to fit college into busy work and family schedules, but they can help anyone make education possible. For details about FLO, students may check NWTC's website or call (800) 422-NWTC, extension 5431. To find out whether any of their courses are offered through FLO, students should consult an NWTC Academic Advisor at (920) 498-5444 or toll-free, (800) 422-NWTC, extension 5444.

## Accelerated Learning

Accelerated courses use special instructional techniques chosen for their ability to help students learn and retain large amounts of information. Students do much of their learning on their own, often on the job, so that required classroom time is shortened. Most courses will require about one half the amount of class time compared to traditional courses.

Accelerated courses require highly motivated students who are already on the job. They will need to draw from their work experience to fully participate in the wide variety of learning experiences and projects. Accelerated courses require reading and an assignment to be completed before the first class. Assignment packets are mailed to students prior to their first class.

## Self-Paced Learning

Some computer, math, and accounting courses are offered for credit in the self-paced format.

Self-paced students follow a course outline on their own, working when and where it is convenient. When they need assistance, study space or assessments, they can come to specialized labs held on the Green Bay campus and most other campuses and Regional Learning Centers. During self-paced lab hours, instructors are available to work with students one-on-one.

Self-paced classes are best for learners who are self-disciplined and work well without supervision. Shift workers, parents, individuals who have busy or changeable schedules, and those with transportation issues may find that self-paced courses fit their needs.

**Note:** Many Basic Education courses are also self-paced. Please see the Basic Education section of this catalog for details.

## Weekend College

Weekend College is an alternative, non-traditional way to pursue educational objectives at NWTC. Courses are offered on the weekend (Friday night and/or Saturday) and meet one to four weekends per month. Classes usually meet for four to eight hours.

Credit and non-credit courses are available. Most of the credit courses "ladder" into a specific certificate, technical diploma, or associate degree program.

For more information, please contact the Flexible Learning Manager, Donna Meves, (920) 498-6872, [donna.meves@nwtc.edu](mailto:donna.meves@nwtc.edu) or (920) 498-5431.

## Individual Technical Studies

Rapid changes in technology and work processes have created a growing demand for employees with enhanced skills that cut across traditional occupational categories. This versatile associate degree complements industry needs, enabling students to combine the skills taught in two or more existing NWTC programs. Each degree is designed in cooperation with an occupational mentor from the target industry and an academic advisor from NWTC. As a result, students earn an associate degree tailored to their specific employment needs. Explore the possibility of Individual Technical Studies in areas such as: Childcare Administration, Entrepreneurship, and other exciting opportunities. For more information about Individual Technical Studies, contact Donna Meves, (920) 498-6872, [donna.meves@nwtc.edu](mailto:donna.meves@nwtc.edu)

## Online Learning

Designed with the working adult in mind, online classes give you another way to pursue your education and realize your dreams without having to travel hundreds of miles for the curriculum you need. Online classes allow you to learn in a wide range of program areas without attending formal classes. Online classes let you complete your classes from home with the guidance of our highly qualified instructors.

NWTC offers online classes which are available any time and anywhere students have access to the Internet—in the District or out-of-state, at the library or at home, during the day or late at night. For details, go to [www.nwtc.edu](http://www.nwtc.edu) and type **Online** in the search box or call (920) 498-5503.



# Flexible Learning Options

## Technical College of the Air (TCA)

Students learn at home and earn college credit through video/print based courses. DVD's and VHS tapes are available for checkout at all NWTC campus libraries and public libraries located throughout the area. After registering, students may begin their courses at the semester start date or any time thereafter allowing increased entry and exit flexibility for learners. DVD's and VHS tapes may also be mailed by calling the NWTC Green Bay Library.

### **The following video/print-based classes are available:**

Business-Intro  
Communication-Oral/Interpersonal  
Communication-Written  
Economics  
Elementary Algebra/w Apps  
English Composition 1  
English Composition 2  
Entrepreneurship  
Finance-Personal  
Intro to College Math  
Intro to Psychology  
Intro to Sociology  
Law-Business  
Marketing Principles  
Math with Business Applications  
Medical Terminology  
Nutrition Pathways  
Race Ethnic & Diversity  
Selling Principles  
Speech  
Supervision  
Technical Reporting

For information, call Sherry Olive at (920) 498-5571, or toll-free, (800) 422-NWTC, extension 5571.

## Interactive Television (ITV) and Video Conference

Live Interactive Television (ITV) and live Video Conferences (VC) enable learners in distant communities to participate in classes being taught elsewhere. Learners can receive courses and credentials in a multitude of areas including banking, marketing, law enforcement, safety, medical terminology, leadership skills, and communications.

Technology allows enrollments at multiple sites to be combined, increasing opportunities and access for learners wishing to pursue degrees, diplomas, certificates, and personal enrichment courses. ITV and VC make courses more convenient for students, because they can considerably reduce commuting time as well as increase opportunities.

Dedicated connections to NWTC Regional Learning Centers create greater access and flexibility for learners. The College can also reach area high schools' sites through the TRITON, PenNet, BayNet, and KSCADE Distance Learning networks, which cover all nine counties in the NWTC district. These networks enable NWTC to provide transcribed and advanced standing courses to high school juniors and seniors. Adult continuing education courses at distant sites in the evenings and services to business and industry are readily available through these technologies. NWTC can also connect with all other Wisconsin Technical Colleges and other K-12 schools.

The Green Bay campus has four ITV classrooms, and the Marinette and Sturgeon Bay campuses each have two ITV classrooms.

NWTC Video Conference (VC) technology is a video/audio communication tool, similar to ITV, that connects the Green Bay, Marinette, and Sturgeon Bay campuses to the regional learning centers.

# Certificates

NWTC offers a variety of short-term programs that lead to certificates. Ranging from six to eighteen credits, certificates allow students to quickly upgrade their skills in their current fields, change job positions, enter new fields, or jumpstart their degree or diploma programs.

## Career Advantage

Employers recognize the value of an NWTC education. In fact, as members of NWTC's advisory committees, employers work with the College's instructors and graduates to design certificates as groupings of courses that meet the ever-changing needs of business and industry. With their up-to-date skills, certificate completers have a competitive edge during hiring and promoting situations.

## Right for Working Adults

Certificate programs are an excellent educational option for working adults or anyone with a busy lifestyle. Many certificate courses are conveniently offered at night, on weekends, or online. Classes may also be available on DVD, video or through interactive television and video conference technology. (see Flexible Learning Options, pages 20-21)

## Another Approach to College

For students whose goals include earning a degree or diploma, enrolling in a certificate program can be a smart first step. Many of NWTC's certificates transfer, fully or partially, to the College's associate degree or technical diploma programs. This enables students to get a strong start on their long-range educational goals, before having to commit to an entire degree or diploma program.

## Certificates that fully transfer to NWTC degrees and diplomas

All of the credits from each of the certificates below can transfer into a related NWTC degree or diploma program.

<b>Certificate Name</b>	<b>Related Degree or Diploma Program</b>
Advanced Leadership .....	Leadership Development
CAD (Computer Aiding Drafting) .....	Mechanical Design Technology
Casino Mgmt: Customer Relationship Mgmt .....	Casino Management
Casino Mgmt: Founds of Gaming Leadership .....	Casino Management
Casino Mgmt: Regulations & Operations .....	Casino Management
Casino Mgmt: Security & Surveillance .....	Casino Management*
Computer Support.....	Computer Support Specialist
Customer Relationship Management .....	Marketing*
Early Childhood Advanced .....	Early Childhood Education
Early Childhood Foundation .....	Early Childhood Education
Early Childhood Intermediate.....	Early Childhood Education
Early Childhood Licensing Basic - Ages 0-2.....	Early Childhood Education
Early Childhood Licensing Basic - Ages 3-5.....	Early Childhood Education
Early Childhood Premier .....	Early Childhood Education
Early Childhood: The Inclusion Credential .....	Early Childhood Education
Early Childhood: The Preschool.....	Early Childhood Education
Ethical Leadership .....	Leadership Development
Gemology .....	Jewelry Repair & Fabrication
Global Business .....	Supply Chain Management*
Greenhouse Growers.....	Landscape Horticulture
Health Care Business Services .....	Health Care Business Services
Horticulture Landscape .....	Landscape Horticulture
Hotel & Restaurant Management.....	Hotel & Restaurant Management
Industrial Maintenance.....	Electro-Mechanical Tech
Intro to the Instructional Assistant Careers.....	Instructional Assistant
Leadership .....	Leadership Development
Library Assistant.....	Instructional Assistant
Networking.....	IT Network Specialist
Process Improvement.....	Leadership Development
Software Level 1 .....	Administrative Assistant
Software Level 2 .....	Administrative Assistant
Special Education .....	Instructional Assistant*
Supervision .....	Leadership Development
Supply Chain Management .....	Supply Chain Management
Supporting Children's Learning .....	Instructional Assistant
Web Marketing Strategy .....	E-Business Technology Specialist*
Website Design .....	E-Business Technology Specialist

\* Program may require specific electives to be taken in order for certificate to fully transfer.

For more information, or for a Certificate Options Book listing all the certificates and a personalized certificate plan, contact Donna Meves, Flexible Learning Manager, (920) 498-6872, (920) 498-5431 or donna.meves@nwtc.edu



# Certificates

## Certificates that partially transfer to NWTC degrees and diplomas

Several credits from each of the certificates below can transfer into a related NWTC degree or diploma program.

Certificate Name	Related Degree or Diploma Program/s
Applied Graphics ..... for Prototype & Design	Prototype and Design Marketing & Graphic Communications Print Technology
Business Administration.....	Credit Business Management Business Management
CAD (Computer Aiding Drafting) .....	Mechanical Design Technology Prototype and Design
Central Service Technician .....	Surgical Technologist
Computer Support .....	Computer Support Technician
Customer Relationship Management .....	Business Management
Digital Photography .....	Digital Media Technology
Industrial Maintenance.....	Automation Engineering Technology Electro Mechanical Technology
Internet Broadcasting .....	Digital Media Technology
Maintenance Electricity .....	Electricity
Medical Coding Specialist.....	Health Information Technology Health Care Business Services
Parametric Modeling.....	Mechanical Design Technology
Phlebotomy Certificate.....	Clinical Laboratory Technician
Promotions and Event Management.....	Hotel & Restaurant Management Marketing
Purchasing and Supply Management.....	Supply Chain Management
Retail Leadership .....	Business Management
Recording and Audio Engineering .....	Digital Media Technology
Small Business Bookkeeping.....	Accounting
Software Level 1.....	Office Assistant
Software Level 2.....	Office Assistant
Utility Management.....	Leadership Development

For more information, or for a Certificate Options Book listing all the certificates and a personalized certificate plan, contact Donna Meves, Flexible Learning Manager, (920) 498-6872, (920) 498-5431 or donna.meves@nwtc.edu

## Certificates that enhance existing knowledge or experience

These unique certificates provide specialized skills for a specific career path. They are designed to prepare individuals to enter a particular field of employment, or provide a level of continuing education for those already employed. Some individual courses may transfer to a program.

Certificate Name	Related Career or Skills
Advanced Real Estate Sales/Brokerage .....	Educates students about the essence of real estate sales and brokerage
Alcohol and Other Drug Abuse..... (AODA)	Assists individuals interested in identifying substance abuse, or may be used toward becoming certified in AODA counseling
Business Writing .....	Reviews basic writing skills
Community Corrections .....	Prepares learners for employment in community corrections
Community Dental Health.....	Designed for hygienists or unlicensed individuals who currently work with a dental public health program
Cultural & Social Sciences .....	Increases students' awareness and knowledge of cultural and social sciences
Digital Printing .....	Educates learners on the growing digital printing trend
Entrepreneurship.....	Prepares students to start, run, and manage profitable businesses
Fundamentals of Real Estate.....	Educates learners about the specifics of real estate sales
General Studies Transfer-UW-Oshkosh .....	Meets specific general education requirements at UW-Oshkosh (see p. 112)
General Studies Transfer-UW-Green Bay .....	Meets specific general education requirements at UW-Green Bay (see p. 112)
Health Unit Coordinator.....	Focuses on coordinating non-clinical tasks in a healthcare setting
Masonry Construction .....	Provides basic job skills in the field of masonry construction
Math-Primer.....	Reviews and strengthens students' math skills
Math-Advanced .....	Enables students to review or acquire college algebra, trigonometry, and basic calculus skills
Paralegal-Post Baccalaureate.....	Designed for learners who already hold a bachelor's degree and wish to work in a law office
Psychology & Behavioral Studies.....	Increases students' knowledge in psychological and social science studies
Social and Human Services .....	Increases students' knowledge and understanding of the social sciences

# Student Services

The Division of Student Services provides a broad range of programs and services to help students achieve their academic and career goals and to enhance their personal, intellectual, and social development.

## Services include:

- Academic Advising
- Admissions
- Assessment
- Career Counseling
- Personal Counseling
- Financial Aid
- Minority Student Assistance
- New Student Orientation
- Recruitment
- Referral Services
- Registration
- Special Accommodations
- Student Employment Assistance
- Student Life
- Support Services/Tutoring/Accommodations

For more information, go to [www.nwtc.edu](http://www.nwtc.edu) or call (920) 498-5444 or toll-free, (800) 422-NWTC, extension 5444.

## Center for Careers and Student Employment

The Center for Careers and Student Employment on the Green Bay Campus and the Career Centers on the Marinette and Sturgeon Bay Campuses offer a wide variety of services including information on careers, job seeking skills and assessments. Individuals can complete interest inventories and investigate details of specific occupations, career paths, and education/training needs.

**NWTC's Shadowing Program** lets visitors follow an NWTC student in classes for part or all of a day.

**Campus Tours** give visitors the chance to see the hands-on equipment our students use and, often, to meet with NWTC staff or students in a given program area.

For more information on any of the above services, go to [www.nwtc.edu](http://www.nwtc.edu) or call (920) 498-6250 or toll-free, (800) 422-NWTC, extension 6250.

## Academic Advising, Counseling, and Special Needs Services

### Vision Statement

Your goal is our commitment. We are fully dedicated to providing services and opportunities that ensure learners achieve their goals and dreams.

### Services Available:

**Academic Advising** is available for those who need assistance in course selection, transfer of credit, or general information about programs including admission requirements and academic planning.

**Career Counseling** is offered for those who are undecided about their career or are considering a career change. Counselors can assist by reviewing career inventory assessments and by discussing previous work experience.

**Personal Counseling** is available for those who are faced with managing, coping, and dealing with personal problems.

**Services for learners with disabilities** at all campuses are coordinated through the Special Needs Office on the Green Bay campus. To request special accommodations, call (920) 498-5444 or (800) 422-NWTC, extension 5444. To request sign language interpreter services, call (920) 498-6390 (v). Counselors at the Sturgeon Bay or Marinette campuses and instructors at the Regional Learning Centers can also arrange services at the Green Bay office.

### Tutoring

If you need help in a course, NWTC has FREE individual tutoring and/or group study to assist you. You may arrange for a tutor if you and your instructor agree that tutoring is needed, if you are attending class regularly, and if a tutor is available. Contact your instructor to request a tutor or call the Tutor Coordinator at (920) 498-5693.

Counseling is available for those interested in the Certificate of General Education Development (GED Certificate), the High School Equivalency Diploma (HSED), Youth Options, Alternative High School, Returning Adult Services, and Drug/Alcohol/Wellness issues. The Counseling/Advising Center is culturally sensitive and offers the services of the Multicultural Center as a support service. Overall, the advising/counseling interview is a confidential interaction between a trained, experienced professional and the student or group of students.

In Green Bay, room SC240, call (920) 498-5444, (800) 422-NWTC, extension 5444; in Marinette, (715) 732-3872, (800) 422-NWTC, extension 3872; in Sturgeon Bay, (920) 746-4900, (800) 422-NWTC, extension 4900.

### Hours of service at the three campuses are:

#### Green Bay campus

Monday through Thursday.....8:00 a.m. - 7:00 p.m.  
Friday.....8:00 a.m. - 5:00 p.m.  
Saturday .....8:00 a.m. - 11:00 a.m.

#### Marinette campus

Tuesday and Wednesday.....8:00 a.m. - 7:00 p.m.  
Monday, Thursday, and Friday..8:00 a.m. - 4:00 p.m.

#### Sturgeon Bay campus

Monday, Tuesday, Friday .....8:30 a.m. - 4:30 p.m.  
Wednesday, Thursday .....8:30 a.m. - 7:00 p.m.

**Appointments are recommended and walk-ins welcomed. Hours may vary during summer and holidays.**

# Student Services

## Library

As both a physical and virtual library, NWTC's Library strives to meet your informational needs. The Library's resources include books, e-books, videos/DVD's, magazines/newspapers, e-journals, and electronic reserves. It offers an open computer lab, group study rooms, and a fiction center. The Library can also borrow materials through interlibrary loan or provide library cards for other area libraries. With its 24/7 virtual reference service, students can e-mail or instantly chat with a librarian any time! For complete information regarding the Library's resources and services, please go to [www.nwtc.edu](http://www.nwtc.edu) and type **Library** in the search box.

## Equal Opportunity

Northeast Wisconsin Technical College complies with all state and federal laws regarding equal rights in education and employment. The College has established the College Diversity and Affirmative Action office to ensure that equal opportunity is available without regard to race, color, national origin, creed, gender, sexual orientation, age, disability, marital status, ancestry, or arrest/conviction record in employment and in admission to educational programs and activities sponsored by the College.

Questions concerning discrimination, harassment, and/or equal opportunity may be directed to the Director of College Diversity on the Green Bay campus at (920) 498-6826. To file a complaint, provide a detailed description of the time, place, and circumstances to the appropriate personnel according to the grievance procedure outlined in the Student Handbook.

For information or copies of the grievance procedure, call the number above or write to:

Director of College Diversity  
Northeast Wisconsin Technical College  
2740 West Mason Street  
P.O. Box 19042  
Green Bay, Wisconsin 54307-9042

## Multicultural Center

The Multicultural Center (MC), located in Room SC139 on the Green Bay Campus, is here to assist NWTC's multicultural student body and to connect students from other countries. The MC provides social and cultural information and a "comfort zone" where:

- Minority students can get support for their academic progress.
- All students can learn about other countries and cultures they will encounter on the job.
- Students can get news and information in other languages.
- Students can access academic advising four days a week.

Information about various cultures—including printed materials, videos, and firsthand knowledge—is available to help both minority and majority culture students enrich their education.

Students involved with the MC can also find assistance in arranging for instruction in English Language Learners (ELL), pursuing their HSED or General Education Development® (GED) Tests transcript, scheduling classes, and academic advising with advisors of minority backgrounds.

The Center offers a place where students can speak their native language and where individuals who speak other languages can call for information about NWTC.

Assistance in other languages is available by calling (920) 498-6895 (in Hmong), (920) 498-6894 (in Spanish), or by fax at (920) 498-6834.

All members of the public are welcome to visit the center, learn about NWTC, and share their background.

International students who need assistance with admissions, visas, academic advising, and Student and Exchange Visitor Information System (SEVIS) reporting should contact the Registrar's Office at (920) 498-6269.



# Student Services

# Study Abroad/ Global Education

## NWTC Student E-mail

NWTC students have a free student e-mail account for school and personal use. Students must use their NWTC e-mail account for any College business. They may use it for personal communication if they wish.

To use student e-mail, go to **www.nwtc.edu**, click on **my.NWTC** and follow the login instructions.

## Student E-Mail: Frequently Asked Questions

### What is my e-mail address?

Your e-mail address is:  
**firstname.lastname@mymail.nwtc.edu**

### Where do I find my instructor's e-mail address?

Look for the "Search" window on your my.NWTC home page. Type the instructor's last name in the "Faculty/Staff" field and click "Go."

### Where can I find more information about my e-mail account?

Click the "Student Help" link at the top of your my.NWTC home page.

**If you still experience problems,** please call the 24/7 Student Help Line at (800) 422-NWTC, ext. 6900, or (800) 422-NWTC, ext. 5444, or 920-498-5444.

## Let Us Tell You More!

**High School Visits** – College representatives personally meet with interested students at their high schools to discuss career education opportunities. Visits are scheduled through high school student services offices. Students can ask their counselors when the NWTC rep will be at their high schools. Representatives are also available in classroom presentations, parent nights, parent/teacher conferences, and education and career fairs.

**Tech Camp** provides three-day career exploration workshops for students entering grades five through eight. Participants tackle a wide range of projects – like gathering police evidence, treating injuries, or wiring an electrical alarm.

For information on the above services, please call the Recruitment Office at (920) 498-6276 or (800) 422-NWTC, extension 6276.

## Expand your horizons while enhancing your employability!

- Learn more about yourself—step outside your comfort zone
- Earn credits toward your degree or diploma
- Improve your intercultural communication skills
- Increase your global awareness/understanding
- Get first-hand international experience to set you apart from others when applying for a job
- Meet interesting people
- Develop an appreciation for cultural differences in the workplace
- Enjoy an unforgettable experience that could be the highlight of your college career!

Learn more by contacting Kelly Holtmeier, Manager of International Education: [kelly.holtmeier@nwtc.edu](mailto:kelly.holtmeier@nwtc.edu), (920) 498-6384 or (800) 422-NWTC, ext. 6384; or go to **www.nwtc.edu** and type **StudyAbroad** in the search box.





# Student Life

## Mission Statement

The mission of the Student Life Office is to promote the development of the whole student by complementing the academic experience through a variety of innovative activities.

Co-curricular events are designed to provide a wide base of experience paralleling professional, leadership oriented, technical, civic, and social activities.

## Student Senate

Student Senate representatives from each student organization are named at the beginning of each year. They meet twice monthly to promote the welfare of the student body. The Student Senate Board, made up of officers elected from the representatives, outlines plans and policies.

## Student Photo ID's

Student ID's are available to all NWTC students who are currently enrolled in a class (credit or non-credit).

- Basic Student Photo ID – No charge.
  - Wellness Center/Gym Photo ID – \$5 charge - enables students to access the wellness center/gym/walking track.
- For more information, call (920) 498-5483 or (800) 422-NWTC, extension 5483.

## Lockers

Lockers can be rented for \$10.00 per semester (fall, spring, summer).

## Student Discounts

Students can receive discounts at many local businesses with their student Photo ID. Students can find a complete list of discounts at [www.studentsavingsclub.com](http://www.studentsavingsclub.com)

## Student Organizations

There are many student organizations active on the Green Bay, Marinette, and/or Sturgeon Bay campuses. The main purpose of each organization is to provide the opportunity to gain educational experience outside of the classroom in working toward desired goals. New organizations are always welcome and encouraged!

- Architectural
- Asian American Student Association
- Auto Club
- Ballroom Dance
- Business Professionals of America (Marinette)
- Clinical Lab Technicians
- Club ED
- Collision Repair
- Criminal Justice Association
- Dental Assisting
- Dental Hygiene
- Diesel (Sturgeon Bay)
- Electronics Club
- Fire Protection (Marinette)
- Health Care Business Services/Health Information Technology
- Hispanic American Student Association
- Horticulture
- Intertribal Student Council
- Jewelry Repair & Fabrication
- Manufacturing Engineering Club (MFENG)
- Medical Assisting
- Phi Theta Kappa International Honor Society
- Physical Therapist Assistant
- Respiratory Care
- SkillsUSA
- Students Taking Responsibility in Drug Education (STRIDE)
- Supply Chain Management
- TEC Club (The Electricity Club)
- Wisconsin Marketing and Management Association (WMMA)
- Young Farmers Association

## College Events

Students are encouraged to join in the variety of activities that are offered on campus. For details, check the online student activities calendar.

- Awards Banquet
- Entertainers: Musicians, Comedians, Hypnotists
- Digital Lounge/Cyber Cafe
- Discounted Marcus Movie Passes
- District Ambassador Competition
- Drive-in Movie
- Family Movie Nights
- Game Room Tournaments
- Graduation Ceremonies
- Intramural Sports
- Leadership Development Opportunities
- National Association for Campus Activities
- On-Campus Movies in Movie Lounge
- Student Life Facebook
- Student Savings Club
- Student Senate
- Socials (welcome back social, fall picnic, etc.)
- Volunteer Opportunities
- Webcasts
- Wisconsin Student Government

## Blood Drive

The American Red Cross makes two visits to the Green Bay campus per year. Students and staff can meet some of their civic responsibility by donating blood.

## Tournaments

Tournaments offer individual students the opportunity to participate each semester. These tournaments may include air hockey, foosball, ping pong, pool, darts, and Wii.

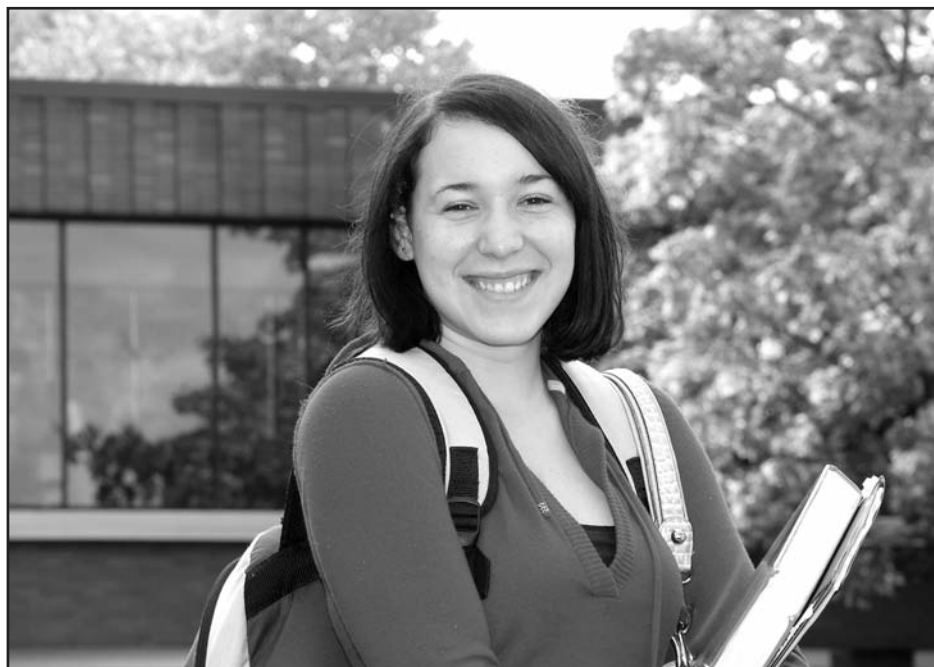
## Intramural Sports

All sports leagues are supervised by the Student Life Office. The intramural program currently includes basketball, flag football, and volleyball.

## Wellness Center/Gym

Cardiovascular and weight equipment along with a basketball court and walking track are available to students with a Wellness Center/Gym Photo ID card.

# General Education



General Education courses provide work-oriented learning in communication, mathematics, natural science, and social science. They are designed to help learners succeed in college, on the job, and in daily living. All associate degree and most technical diploma programs require courses in General Education. In addition to supporting NWTC programs, many General Education courses can be transferred to other Wisconsin Technical Colleges and to four-year colleges and universities.

These courses are offered throughout the District. For more information, students can call the Green Bay campus at (920) 498-5400 or (800) 422-NWTC; the Marinette campus at (715) 735-9361; or the Sturgeon Bay campus at (920) 743-2207, and ask to speak with a counselor.

Before taking General Education courses, students should meet high school exit competencies in English, mathematics, science and social science.

## What Students Will Learn:

### Communication

Based on a program's required communication courses, an NWTC graduate should be able to do the following:

- Use verbal, nonverbal, and listening skills to improve communication.
- Present information before a group.
- Prepare job-seeking documents.
- Compose business and technical documents using a computer.
- Use design techniques to help readers better understand a document.
- Follow the rules of standard English grammar, usage, and punctuation.

### Mathematics

Based on a program's required mathematics courses, an NWTC graduate should be able to do the following:

- Apply problem-solving strategies utilizing basic arithmetic skills, including percents, ratios and proportions, into appropriate formulas and models. Outcomes will include a general sense of numeracy required in the trades, business and/or industry.
- Demonstrate quantitative literacy by translating applied problems from business and industry into mathematical expressions and solve by applying numerical, graphical, geometric, and algebraic methods.
- Solve problems by using algebraic methods including linear and quadratic relationships. The ability to analyze data using probability and statistical models will allow learner to organize and describe data.
- Solve applied problems from business and industry by using algebraic methods including quadratic and trigonometric relationships. Quantitative skills will include appropriate application of technology.
- Model and solve real-world problems in business or industry using trigonometric, quadratic, parametric, exponential or logarithmic relationships, including the ability to analyze data using probability and statistical models. Quantitative skills will include appropriate application of technology to make inferences to draw conclusions.
- Balance graphical, numerical, algebraic/analytic and communication techniques using differential and integral calculus to obtain solutions to problems in physics and mathematics as well as in business and industry. An appreciation of calculus as a coherent body of knowledge and a human accomplishment will form the foundation for quantitative literacy.

## Natural Science

Based on a program's required science courses, an NWTC graduate should be able to do the following:

### Anatomy & Physiology

- Recognize and identify human anatomy.
- Explain the physiology of the body systems and how they are affected by daily activity.
- Explain normal and abnormal physiological processes as they relate to proper care of a patient's needs.
- Correlate treatment procedures and integrate these into a physiological approach to patient care.

### Chemistry

- Collect and quantitatively analyze empirical data using scientific method.
- Describe chemical principles influencing solutions of the body/environment.
- Utilize scientific terms/nomenclature as related to medicine, agriculture, and environmental applications.
- Describe chemical pathways involved in cellular metabolism during health/disease.
- Argue merits and risks of biotechnology in social and professional context.
- Interpret molecular structures as applied to influences on water solubility, physiology, agriculture, and environmental applications.

### Microbiology

- Analyze the characteristics of infectious microorganisms (transmission, course of disease, symptoms, complications, diagnosis, treatment, prevention) related to patient care.
- Discuss the control of infectious organisms (standard precautions, isolations, chemotherapeutic agents, disinfection/sterilization methods), and roles in controlling/spreading microorganisms.
- Describe the nonspecific/specific defenses of the immune system in fighting disease, how vaccination/immune globulins are used to prevent disease, and how immunosuppression and disorders of the immune system are related to patient care and disease.

### Physics

- Apply English and metric measurement systems to related fields.
- Apply scientific method/stepwise problem-solving techniques for success in life and work.
- Apply statics (forces) and dynamics (motion) to career related topics.
- Relate various forms of energy: thermal, electrical/magnetic, sound, light and mechanical to career-related areas.
- Utilize the concepts of properties of matter (elasticity, pressure, density, etc.) in career related areas.

### Social Science

Based on a program's required social science courses, an NWTC graduate should be able to do the following:

- Apply economic principles to life roles as consumer, worker, and citizen.
- Interpret the complexities of globalization from a sociological perspective.
- Evaluate physical, cognitive, and psychosocial development across the lifespan.
- Apply psychological principles to life and work.
- Develop skills to succeed in a diverse world.

# Basic Education

Basic Education is designed to help people succeed in college, on the job, and in daily living. Individualized education and group courses are offered at Green Bay, Marinette, and Sturgeon Bay campuses and at Regional Learning Centers. These classes can help students develop skills to achieve specific goals:

- Preparing to enter college
- Succeeding in courses
- Keeping a job, or preparing for a new job
- Earning a High School Equivalency Diploma (HSED) transcript or General Education Development® (GED) Tests transcript
- Learning English
- Reaching personal goals

All members of the public are welcome to use any of the services that meet their needs.

## Getting Started

Individuals will be evaluated to determine their strengths and areas for improvement. The student and an instructor or counselor will develop a Personal Educational Plan (PEP) based on the student's assessment results, goals, learning style, and abilities.

## Skills Help Available through NWTC

### A. Math Skills

#### Basic Math (Arithmetic)

- Whole Numbers
- Fractions
- Decimals
- Percents
- Measurements

#### Algebra

- Real Numbers
- Algebraic Expressions
- Equations and Inequalities
- Word Problems and Measurements

### B. Reading Skills

- Reading Rate
- Comprehension
- Vocabulary

### C. Communication (English) Skills

- Writing
- Punctuation
- Grammar
- Capitalization
- Spelling

### D. Orientation to College Learning

Individualized programs assist you in achieving academic success in areas such as:

- Note taking
- Concentration
- Listening
- Outlining
- Test taking
- Summarizing
- Textbook study
- Reference skills
- Time management
- Memory techniques

### E. Study Skills Seminars

- Strategies for Textbook Study and Concentration
- Using Your Notes and Your Time to Your Advantage
- Preparing for Tests and Easing Anxiety
- Strategies for Studying Math

### F. Strategies for Success

- Successful student strategies
- “Make the grade” connections

## Basic Education

### Mission Statement

The mission of Basic Education is to help a diverse population of learners acquire basic skills and reach their goals for education, employment, and personal enrichment through learning opportunities provided in a positive and nurturing environment.

## Choose the Format and Location That Meet Your Needs

The student can choose to study in one of the following formats:

- A. Individual learning on an NWTC campus
- Open lab setting - students set their own schedules and work through required text at their own pace
  - Instructors are available
  - Three sites
  - Day and evening hours available

#### For information, call:

Green Bay Campus  
Academic Skills Lab, (920) 498-5686

Marinette Campus  
(715) 732-3644 or (715) 732-3498

Sturgeon Bay Campus  
(920) 746-4910

- B. Classroom learning on the Green Bay campus
- Courses offered at set times
- For information, call: (920) 498-5421

## Community Sites and Regional Learning Centers

- Crivitz 1-866-854-3338
- Green Bay Wisconsin Job Center (920) 498-5421
- Luxemburg 1-866-845-5945
- Niagara 1-866-528-5883
- Oconto Falls 1-866-639-6982
- Shawano 1-877-316-1274

## English Language Learner (ELL)

- Varied sites and times
- Focus on reading, writing, listening, speaking, and using computers on six skill levels

For information on Green Bay English Language Learner (ELL) classes, call (920) 498-6297 or (920) 498-7593.

For English Language Learner (ELL) information in **Spanish**, call (920) 498-6894.

For English Language Learner (ELL) information in **Hmong**, call (920) 498-7593.

Basic Education courses are not eligible for financial aid.



# Shared Programs

**A shared program is an associate degree or technical diploma offered jointly by two or more technical colleges. Northeast Wisconsin Technical College shares the following programs, allowing students access to additional program opportunities.**

## Fire Protection Technician

### Associate Degree

Offered through a partnership between Northeast Wisconsin Technical College and Fox Valley Technical College

A fire protection technician protects life and property through fire prevention efforts and, if necessary, by proper firefighting principles and techniques. Graduates are well trained in the progressive, proactive philosophy of the modern fire service which emphasizes fire prevention and public education, as well as the traditional firefighting and emergency medical service components.

Students have the opportunity to complete training for the State of Wisconsin Firefighter I and II, Inspector I, Driver/Operator, and Hazardous Materials Technician certification, as well as to become EMT-Basic certified while completing their associate degree. The Fire Protection Technician program is designed to permit new students to enter at the start of each semester as openings exist.

**Information:** NWTC Admissions, (920) 498-5444 or (800) 422-NWTC, extension 5444, or [www.nwtc.edu](http://www.nwtc.edu)

## Human Services/ AODA Counselor

### Associate Degree

Offered through a partnership between Northeast Wisconsin Technical College and College of Menominee Nation

The Human Services/AODA Counselor Program provides students with the course work and hours of study required by the Wisconsin Department of Health and Family Services to become licensed as an Alcohol and Drug Abuse Counselor. Upon graduation students will receive credit for 500 hours of field experience and 125 hours of counseling experiences and will allow students to formally begin the practical requirement of working to complete the required number of counseling practice hours. The graduate of the AODA associate degree program will function as an entry-level practitioner in multiple settings.

The AODA Counselor Program is licensed by the State of Wisconsin.

Note: The Wisconsin State legislature requires a background check under the Caregiver Law 48.685 and 50.065 Stats. Students may not be eligible to work in this field if convicted of certain felonies.

**Information:** NWTC Admissions, (920) 498-5444 or (800) 422-NWTC, extension 5444, or [www.nwtc.edu](http://www.nwtc.edu)

## Judicial Reporting/ Broadcast Captioning

### Associate Degree

Offered through a partnership between Northeast Wisconsin Technical College and Lakeshore Technical College

Judicial reporters provide instantaneous text transcriptions for legal proceedings, television programming, and hearing-impaired individuals. A good career fit for individuals who are excellent listeners, have strong language and communication skills, and are detail-oriented. Students will demonstrate knowledge of professional reporting organizations and methods of gaining certification as a Registered Professional Reporter or Certified Realtime Reporter. Interactive TV is used to receive courses from LTC. Students are required to lease their own stenograph machines and laptop computers. Software is provided.

**Information:** Lakeshore Technical College, (888) 468-6582 or [www.gotoltc.com](http://www.gotoltc.com)

## Nuclear Technology

### Associate Degree

Offered through a partnership between Northeast Wisconsin Technical College and Lakeshore Technical College

The Nuclear Technology program is designed to provide students with the opportunity to develop the technical expertise, math and analytical skills as well as the interpersonal skills required to begin successful careers as nuclear operations technicians and radiation protection technicians. The majority of the technical course work will be delivered in NWTC's Manufacturing Technology Center. Nuclear industry specific courses will be delivered via Interactive TV from LTC. General education courses can be taken through a variety of delivery methods.

**Information:** NWTC Admissions, (920) 498-5444 or (800) 422-NWTC, extension 5444, or [www.nwtc.edu](http://www.nwtc.edu)

## Pharmacy Technician

### Technical Diploma

Offered through a partnership between Northeast Wisconsin Technical College and Lakeshore Technical College

Pharmacy technicians are trained supportive personnel for hospital and community pharmacies. The pharmacy technician assists the pharmacist in a variety of technical tasks involving the packaging, distribution, compounding, labeling, and recording of drugs. Interactive TV is used to broadcast to distant sites where the students also have lab instruction and clinical experience.

**Information:** Lakeshore Technical College, (888) 468-6582 or [www.gotoltc.com](http://www.gotoltc.com)

# Associate Degree and Technical Diploma Programs

## Green Bay Campus

Accounting  
Administrative Assistant  
Applied Engineering Technology  
Apprenticeship  
Architectural Technology  
Auto Collision Repair and Refinishing Technician  
Auto Collision Repair and Refinishing Technology  
Automation Engineering Technology  
Automotive Technician  
Automotive Technology  
Business Management  
Casino Management  
Civil Engineering Technology  
Clinical Laboratory Technician  
Computer Support Specialist - IT  
Credit Business Management  
Criminal Justice-Corrections  
Criminal Justice-Law Enforcement  
Criminal Justice-Law Enforcement Academy  
Dental Assistant  
Dental Hygienist  
Diagnostic Medical Sonography  
Digital Media Technology  
E-Business Technology Specialist  
Early Childhood Education  
Electrical Engineering Technology  
Electrical Power Distribution  
Electricity  
Electro-Mechanical Technology  
Electronics (with optional Biomedical specialty)  
Financial Institutions Management  
Gas Utility Construction and Service  
General Studies Transfer  
(UW-Green Bay or UW-Oshkosh)  
Health Information Technology  
Heating, Ventilation, Air Conditioning and Refrigeration Technology  
Hotel & Restaurant Management  
Individualized Technical Studies  
Individualized Technical Studies-Journeyworker  
Industrial Mechanic  
Instructional Assistant  
Jewelry Repair and Fabrication  
Landscape Horticulture  
Machine Tool - CNC Technician  
Machine Tool Operation  
Manufacturing Engineering Technology  
Marketing  
Marketing and Graphic Communications  
Mechanical Design Technology  
Medical Assistant

Network Specialist - IT  
Nursing - Associate Degree  
Office Assistant  
Paralegal  
Paramedic-Emergency Medical Technician  
Physical Therapist Assistant  
Power Engineer and Boiler Operator  
Practical Nursing  
Print Technology  
Prototype & Design  
Radiography  
Respiratory Therapist  
Supply Chain Management  
Surgical Technologist  
Utilities Engineering Technology  
Welding  
Wood Tech

## Marinette Campus

Accounting  
Administrative Assistant  
Applied Engineering Technology  
Apprenticeship  
Automotive Technician  
Automotive Technology  
Computer Support Specialist - IT  
Computer Support Technician - IT  
Fire Protection Engineering Technology  
General Studies Transfer  
(UW-Green Bay or UW-Oshkosh)  
Machine Tool Operation  
Machine Tool Technics (Tool & Die Making)  
Nursing - Associate Degree  
Office Assistant  
Practical Nursing  
Welding

## Sturgeon Bay Campus

Accounting  
Administrative Assistant  
Apprenticeship  
Automotive Technician  
Automotive Technology  
Business Management  
Computer Support Technician - IT  
Diesel & Heavy Equipment Technician  
Diesel Equipment Technology  
Financial Institutions Management  
General Studies Transfer  
(UW-Green Bay or UW-Oshkosh)  
Hotel & Restaurant Management  
Marketing  
Nursing - Associate Degree  
Office Assistant  
Practical Nursing  
Supply Chain Management  
Welding

## Throughout District

Emergency Medical Technician-Basic  
Emergency Medical Technician-Intermediate Technician  
Farm Business & Production Management  
Health Care Business Services  
Leadership Development  
Nursing Assistant



# Accounting

## Associate Degree

Program Code 101011

Offered at the Green Bay and Marinette campuses. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361.

For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Accounting prepares students for positions as accountants. Accountants work with accounting systems, analyze business records, prepare financial reports, and supervise bookkeepers.

### Program Outcomes

- Manage general ledger.
- Manage accounts receivable.
- Manage accounts payable.
- Maintain inventory control.
- Prepare payroll.
- Prepare income taxes.
- Account for fixed assets.
- Perform job order cost accounting.
- Perform process cost accounting.
- Perform standard cost accounting.
- Analyze financial statements.
- Prepare budgets.
- Manage cash flows.
- Use corporate accounting procedures.
- Analyze accounting information to make appropriate decisions.
- Perform reconciliation procedures.
- Create spreadsheets.
- Perform accounting functions using computerized accounting packages.
- Demonstrate proficiency in math using table top calculator and T.I. Business Analyst calculator.
- Perform activity-based costing.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math (algebra recommended).
- Ability to use computer keyboard.

### Employment Potential

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

**Accounts Payable/Receivable Accountant:** records and pays bills of the company, records receivables transactions, bills customers at regular intervals, records charges and payments.

**Payroll Accountant:** handles the payroll for a business; end-of-period reports; time cards; computes overtime, deducts taxes, and prepares payroll checks; and reconciles payroll accounts.

**Inventory Control Accountant:** records receipt and dispersal of goods using a perpetual inventory system, assigns costs using an inventory valuation method.

**Cost Accountant:** determines cost of products manufactured; determines variations from standards in labor, materials, and overhead; prepares budgets; and prepares various management reports.

**Public Accountant:** keeps records for small business; prepares payroll records; prepares financial records, income statements, and balance sheets.

**Accountant:** keeps financial records, prepares financial records (income statements, balance sheets, budgets, and summary reports), and analyzes accounts.

**Tax Accountant:** prepares tax returns for both state and federal governments, assists in tax planning and tax shelters, and files payroll reports and quarterly reports as required by government agencies.

**Governmental/Nonprofit Accountant:** keeps records of governmental/nonprofit agencies using the fund method of accounting.

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

- Auditor
- Certified Public Accountant
- Comptroller
- Treasurer
- Trust Officer

### Curriculum

The Accounting Associate Degree is a two-year, four-semester program. Accelerated options offered at night. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-101-107	Accounting Applications/Proc	2
10-101-110	Accounting 1	4
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-132	Micro: Excel-Part 2	1
10-801-195	Written Communication	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>15</b>

#### Second Semester

10-101-105	Accounting-Computer Ledger	2
10-101-120	Accounting 2	4
10-101-151	Accounting-Payroll	3
10-801-196	Oral/Interpersonal Comm	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-101-131	Accounting-Intermediate	4
10-101-134	Accounting-Cost	4
10-101-154	Accounting-Personal Tax	4
10-101-189	Accounting-Appling Quickbooks	3
10-114-109	Credit-Policies/Procedures	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-101-142	Accounting-Managerial	3
10-101-143	Accounting-Govern/Nonprofit	2
10-101-152	Accounting-Business Tax	2
10-101-153	Accounting-Computerized Tax	1
10-101-156	Accounting-Auto Appl	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-101-105 ACCOUNTING-COMPUTER LEDGER

...applications on calculators such as addition, subtraction, multiplication, division, percent, memory, and business problems and computers using Microsoft Excel. (Prerequisites: 10-103-131, Micro: Excel-Intro; 10-103-132, Micro: Excel-Part 2)

### 10-101-107 ACCOUNTING APPLICATIONS AND PROCEDURES

...use of financial calculator, checkbook records, purchasing, shipping/receiving, A/R, and A/P systems, markups, discounts, credit charges, time value of money, depreciation methods, inventory methods, and financial statement analysis.

**10-101-110 ACCOUNTING 1** ...accounting principles, financial statements, business transactions, accounting cycles/systems, specialized journals, accounting for cash and receivables for sole proprietorships in service or merchandising businesses.

**10-101-120 ACCOUNTING 2** ...inventories, fixed assets, current liabilities including payroll and notes payable, business formations including capital stocks, dividends, bonds, cash flow statements, and financial statement analysis. (Prerequisite: 10-101-110, Accounting 1)

### 10-101-131 ACCOUNTING-INTERMEDIATE

...understand income statements, balance sheets, cash flow statements, cash and receivables, inventories and cost of goods sold, noncurrent operating assets, earnings per share, accounting changes and corrections, financial statement analysis. (Prerequisite: 10-101-120, Accounting 2)

**10-101-134 ACCOUNTING-COST** ...contemporary cost environments and issues; selecting, analyzing, and tracking costs; production costing methods: job order, process, standard costs, by-product, and joint costing. Requires experience with Windows, and prior completion of an introductory course in Word, and introductory and intermediate courses in Excel. (Prerequisite: 10-101-120, Accounting 2)

**10-101-142 ACCOUNTING-MANAGERIAL** ...cost behavioral patterns, cost-volume-profit relationships, segment reporting, profit planning, budgets and overhead analysis, decentralized operations, pricing decisions, capital investment decisions, and service department costing. (Prerequisite: 10-101-134, Accounting-Cost)

### 10-101-143 ACCOUNTING-GOVERNMENTAL & NONPROFIT

...use fundamental knowledge for understanding the operation of governmental and nonprofit entities, their accounting, and financial reporting practices and the standards that shape their accounting and financial reporting systems. (Prerequisite: 10-101-120, Accounting 2)

**10-101-151 ACCOUNTING-PAYROLL** ...payroll and personnel records, social security, withholding tax, unemployment compensation, time sheets and time-keeping records, and legal aspects of payroll. (Prerequisite: 10-101-110, Accounting 1 OR 10-101-101, Accounting Principles)

**10-101-152 ACCOUNTING-BUSINESS TAX** ...learners will be introduced to federal tax laws as they apply to business entities and will prepare business income tax returns. (Prerequisite: 10-101-154, Accounting-Personal Tax)

### 10-101-153 ACCOUNTING-COMPUTERIZED TAX

...learners will prepare individual income tax returns using a commercial software package. Requires completion of the Accounting-Personal Tax course. (Prerequisite: 10-101-154, Accounting-Personal Tax)

**10-101-154 ACCOUNTING-PERSONAL TAX** ...history and research of tax law and regulations; preparation of Federal individual income taxes including forms 1040, 1040A, and 1040EZ, and supporting schedules and forms.

### 10-101-156 ACCOUNTING-AUTOMATED APPLICATIONS

...Windows, file management, worksheet applications, database applications, macros, evaluation of accounting software, installation of software, and conversion of manual accounting system to a computerized system. (Prerequisites: 10-101-120, Accounting 2; 10-101-105, Accounting-Computer Ledger; 10-103-121, Micro: Word-Intro)

### 10-101-189 ACCOUNTING-APPLYING QUICKBOOKS

...learners will be introduced to basic and advanced features of Quickbooks and will apply skills in realistic business simulations including creating accounts, invoicing, budgeting, preparing statements, journaling and graphing.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics; creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ...advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

### 10-114-109 CREDIT-POLICIES AND PROCEDURES

...credit/collection policies, procedures, and law, credit investigations, evaluate credit worthiness, support credit decisions, create credit forms, fraud, bankruptcy, techniques to control and manage accounts receivable.

# Administrative Assistant

Program Code 101066

## Associate Degree

Offered at the Green Bay and Marinette campuses. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361.

For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Administrative Assistant students learn to be efficient and effective office employees through application of business procedures (proofreading, telephone, records management, meeting and travel arrangements, communication, project management, Internet research, etc.) and software skills (Windows, word processing, desktop publishing, spreadsheets, presentation graphics, web creation, electronic calendaring, and database).

All software materials assist in preparing students for the Microsoft Office Specialist (MOS) certification exams.

With additional education and/or work experience, students will be prepared for certification exams offered by the International Association of Administrative Professionals (IAAP).

### Program Outcomes

- Keyboard efficiently using correct techniques.
- Communicate business messages effectively.
- Produce effective business documents.
- Apply organizational skills to prioritize and manage workflow.
- Use appropriate technology to perform office tasks and manage information.
- Plan events, travel, conferences, and meetings.
- Present researched information.
- Integrate appropriate software to produce business documents.
- Demonstrate professionalism in the business environment.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math.
- A keyboarding skill of 20 WPM using the TOUCH method is recommended.

### Employment Potential

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

**Administrative Assistant:** schedules appointments; communicates effectively in person, on the phone, and in writing; transcribes dictation; prepares agendas; takes minutes; arranges itineraries; schedules travel plans; processes mail; uses word processing, spreadsheets, presentation graphics, electronic calendaring, desktop publishing, web creation, and/or database software; maintains confidentiality, and possibly supervises others.

**Customer Service Representative:** receives and places telephone calls; maintains solid customer relationships by handling their questions and concerns with speed and professionalism; performs data entry and uses software programs; may require research skills to troubleshoot customer problems; excellent communication abilities.

**Front Desk Coordinator:** manages the company's lobby area; greets and directs all visitors, including vendors, clients, job candidates and customers; ensures completion of paperwork, sign-in and security procedures; handles special administrative projects as well as overflow work from department and executive assistants; depending on the size of the firm, also may answer incoming calls.

**Legal Administrative Assistant:** performs all duties of an administrative assistant in a legal office specializing in legal formats, terminology, and procedures.

**Medical Administrative Assistant:** performs all duties of an administrative assistant in a medical facility specializing in medical procedures and terminology.

**Virtual Assistant:** works from own premises and provides office support services such as making customer contacts; writing reports; editing documents; sending out marketing materials; setting up and maintaining databases; handling billing and bookkeeping; and updating Web sites.

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

- Executive Assistant
- Office Manager
- Trainer/Instructor
- Event Coordinator
- Team Leader

### Portfolio

Students are guided through the portfolio preparation process prior to graduation.

### Curriculum

The Administrative Assistant Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-111	Micro: Windows-Intro	1
10-103-121	Micro: Word-Intro	1
10-103-122	Micro: Word-Part 2	1
10-103-151	Micro: PowerPoint-Intro	1
10-106-103	Info Process Principles	3
10-106-107	Keyboard-Speed Building 1	1
10-106-112	Keyboard-Speed Building 2	1
10-106-131	Proofreading/Editing Essen 1	3
10-106-153	Professional Profile	3
10-804-123	Math w Business Apps	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### Second Semester

10-103-131	Micro: Excel-Intro	1
10-103-132	Micro: Excel-Part 2	1
10-103-160	Micro: Outlook	1
10-106-126	Admin Business Procedures 1	2
10-106-132	Proofreading/Editing Essen 2	2
10-106-142	Software Projects	3
10-106-152	Records Management	2
10-106-172	Telephone/Messaging Skills	1
10-801-195	Written Communication	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### Third Semester

10-103-141	Micro: Access-Intro	1
10-103-142	Micro: Access-Part 2	1
10-103-163	Micro: Expression Web	1
10-103-165	Micro: Publication Software	1
10-106-136	Admin Business Procedures 2	3
10-196-102	Workplace Interactions	2
10-809-197	Contemporary Amer Society	3
10-809-199	Psychology Of Human Relations	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### Fourth Semester

10-101-103	Accounting Principles-Applied	2
10-106-137	Integrated Software Applic	2
10-106-144	Administrative Asst Intern	3
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>SEMESTER TOTAL</b>		<b>16</b>
<b>TOTAL CREDITS</b>		<b>68</b>

#### Suggested Electives:

Office Politics, 10-106-157  
Meetings-Organizing, 10-106-171  
Oral/Interpersonal Communication, 10-801-196

This program is fully eligible for financial aid.

## 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](http://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.*

**10-101-103 ACCOUNTING PRINCIPLES-APPLIED** ...the accounting fundamentals, recording of business transactions, preparation of financial statements, accrual accounting, accounting for service enterprises and merchandising businesses, payroll, and use of Quickbooks Software.

**10-103-111 MICRO: WINDOWS-INTRODUCTION** ...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-122 MICRO: WORD-PART 2** ...advanced word processing features including working with headers/footers, inserting quick parts, themes, styles, sort and select; text flow; footnotes/endnotes, images, shapes, shared documents; specialized tables and indexes; forms; and sharing data. Requires strong introductory Word skills or Word-Intro.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ...advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-142 MICRO: ACCESS-PART 2** ...creating advanced queries, custom forms, multi-page forms, custom reports with grouping and calculations, integrating, embedding charts, data access pages, pivot tables, pivot charts, labels, and hyperlinks. Requires strong introductory Access skills.

### 10-103-151 MICRO: POWERPOINT-INTRODUCTION

...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-103-160 MICRO: OUTLOOK** ...use email, distribution lists, signatures, attachments, and task lists; schedule appointments and meetings using the calendar; flag, filter, sort, and merge contacts, use message delivery options; archive messages and folders.

**10-103-163 MICRO: EXPRESSION WEB** ...create a Website, customize and manage web pages and images; create and use interactive forms using style sheets; publish Office web pages to a web server. Requires Windows experience.

**10-103-165 MICRO: PUBLICATION SOFTWARE** ...create and edit newsletters, brochures, flyers, forms, business cards, emails, e-commerce websites, and other business publications using publication layout software. Requires Windows experience.

**10-106-103 INFORMATION PROCESSING PRINCIPLES** ...information processing cycle and workflow, terminology, hardware, software, networks, digital media, ergonomics, security, systems, Internet, and career opportunities.

**10-106-107 KEYBOARD-SPEED BUILDING 1** ...skill development on the alphabetic keyboard using analytic/diagnostic software. Minimum alphabetic speed developed is 40 wpm in a 3-minute timing. Requires touch keyboarding at 30 wpm.

**10-106-112 KEYBOARD-SPEED BUILDING 2** ...skill development on the alphabetic keyboard, top-row number keys, and ten-key pad using analytic/diagnostic software. Minimum alphabetic speed developed is 45 wpm in a 5-minute timing. Requires touch keyboarding at 40 wpm.

**10-106-126 ADMINISTRATIVE BUSINESS PROCEDURES 1** ...today's global business environment including time management using software tools, flexible work arrangements, processing mail, meeting coordination, copiers and fax machines, and application of common business communication using appropriate formats. Requires Windows, intermediate Word, PowerPoint, and Outlook experience. (Prerequisite: 10-106-131, Proofreading/Editing Essentials 1; Corequisite: 10-106-142, Software Projects)

**10-106-131 PROOFREADING/EDITING ESSENTIALS 1** ...develop skills for using, identifying, and correcting grammar, spelling, punctuation, capitalization, number usage and abbreviations for creating error-free business documents. Introduction and use of reference manuals/resources and portfolio guidelines. (Touch keyboarding and basic word processing skills are assumed.)

### 10-106-132 PROOFREADING/EDITING ESSENTIALS 2

...apply advanced proofreading and editing skills in electronic and printed business documents using Proofamatics technique, transcription equipment, reference manuals, and resources. Multitasking and decision-making skills are enhanced through transcription and proofreading. (A passing grade in Proofreading/Editing Essentials 1 is a strong recommendation for success.)

**10-106-136 ADMINISTRATIVE BUSINESS PROCEDURES 2** ...today's global business environment including Internet-based research, event planning, customer service, integration of technology, virtual meeting technologies, financial responsibilities, travel coordination, leadership techniques, and career advancement.

**10-106-137 INTEGRATED SOFTWARE APPLICATIONS** ...manipulate and manage data to prepare integrated documents using Word, Excel, Access, PowerPoint, and Publisher, create electronic portfolio using FrontPage, and use practice certification software tests to demonstrate competencies. Requires completion of all Microsoft Office software classes.

**10-106-142 SOFTWARE PROJECTS** ...applying Windows and Word features to manage and format business documents while exercising decision-making, increasing efficiency, and enhancing keyboarding skills. Requires Windows, intermediate Word background, and 40 wpm keyboarding skill.

**10-106-144 ADMINISTRATIVE ASSISTANT INTERNSHIP** ...employment with supervision by employer and instructor; 144 work hours and 17 class hours with related projects, discussions, and program portfolio. Recommended for last semester before graduation.

**10-106-152 RECORDS MANAGEMENT** ...major systems of filing classification: alphabetic, numeric, geographic and subject; retention and disposition of records; records equipment and technology.

**10-106-153 PROFESSIONAL PROFILE** ...developing a professional image and attitude, including study of business ethics and etiquette; goal setting; anger, stress, and time management; understanding of diverse cultures; and development of platform skills.

**10-106-172 TELEPHONE/MESSAGING SKILLS** ...using the telephone effectively and efficiently in the world of work; telephone etiquette, messaging, and voice mail.

**10-196-102 WORKPLACE INTERACTIONS** ...apply effective basic interaction principles when the students SEEK out information, TALK a clear message, FLEX to workplace changes, cope with emotionally charged situations and help your team effectively.



# Applied Engineering Technology

Program Code 106237

## Associate Degree

Offered at the Marinette campus.

For information: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

This program is designed to prepare technicians and team members to work in the manufacturing industry sector. In today's competitive environment, there is a need for specialized training in a variety of manufacturing areas

### Program Outcomes

- Manufacturing materials, processes, and practices.
- Quality assurance.
- Quality systems.
- Statistical process control.
- Materials resource planning.
- Standards and regulations.
- Precision measuring.
- Problem solving techniques.
- Blueprint reading.

*Areas of specialization include:*

- Quality Assurance Technician.
- Industrial/Manufacturing Engineering Technician.
- Safety Technician.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school algebra or equivalent. For a description of algebra skills, see the Basic Education section of this catalog.

### Employment Potential

A graduate with specialization in Industrial/Manufacturing Engineering Technician will have the potential for employment as an Industrial Engineering Technician, Manufacturing Engineering Technician, Standard Engineering Technician and Productivity Improvement Technician. It will also provide skill training for members of Continuous Improvement Teams to increase the likelihood of success for their improvement projects. Individual courses will serve as significant choices as electives for other NWTC associate degree programs.

A graduate with a specialization in Safety Technician will be able to contribute to a safety and health program in any size organization. This specialization is ideal for preparing graduates to work with supervisors and employees to ensure a safe and healthy work environment. Large organizations utilize safety technicians to work on the floor with employees and supervisors. Small organizations may have employee safety responsibilities assigned as an addition to other jobs, and this specialization will prepare graduates for those hands-on responsibilities.

A graduate specializing in Quality Assurance Technician will have potential for employment as a Quality Technician and will have the background to pursue certification with the American Society for Quality (ASQ). As a Quality Technician, the graduate will have skills and knowledge to promote continuous improvement of industrial processes and customer satisfaction through the latest scientific approaches.

### Curriculum

The Applied Engineering Technology program consists of 29 credits of general education, 21 credits of core course material, 15 credits of technical specialization and 3 credits of electives. Upon graduation, a student will have completed 68 credits.

#### ALL STUDENTS MUST COMPLETE

Catalog No.	Description	Credits
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-151	Micro: PowerPoint-Intro	1
10-623-100	Standards/Regs	1
10-623-101	Quality Assurance-TECHSPAN	1
10-623-102	SPC-TECHSPAN	2
10-623-103	Quality Systems-TECHSPAN	2
10-623-105	Precision Measure	1
10-623-106	Interpret Eng Draw	2
10-623-107	Manufacturing Prac	2
10-623-108	Manufacturing Materials	1
10-623-109	Manufacturing Problem Solving	2
10-623-111	Manufacturing Processes	2
10-623-114	Material Resource Planning	2
10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Comm	3
10-804-110	Elem Algebra w Apps	3
10-804-118	Interm Algebra w Apps	4
10-806-154	General Physics 1	4
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-197	Contemporary Amer Society	3
10-809-199	Psychology Of Human Relations	3
	Elective	3
<b>TOTAL CREDITS</b>		<b>53</b>

#### INDUSTRIAL/MFG ENGINEERING TECH SPECIALIZATION

10-623-121	Work Measurement	3
10-623-161	Facilities Planning	3
10-623-162	Process Improvement	2
10-623-163	Equipment Plan/Just	2
10-623-164	Ergonomics/Safety	2
10-623-165	Process Planning	3
<b>SPECIALIZATION CREDITS</b>		<b>15</b>

#### QUALITY ASSURANCE TECHNICIAN SPECIALIZATION

10-606-159	Materials Science	3
10-623-113	Quality Documentation	3
10-623-115	Cust/Vendor Rel/Audits	3
10-623-116	Inspection	3
10-623-133	Quality Engineering	3
<b>SPECIALIZATION CREDITS</b>		<b>15</b>

#### SAFETY TECHNICIAN SPECIALIZATION

10-449-100	Safety Management	3
10-449-101	Regulatory Compliance	3
10-449-102	Accident Investigation	3
10-449-103	Industrial Hygiene-Intro	3
10-449-104	Audits/Inspections	3
<b>SPECIALIZATION CREDITS</b>		<b>15</b>
<b>TOTAL CREDITS</b>		<b>68</b>

#### Suggested Electives:

Emergency Spill Response, 10-449-105  
Construction Safety, 10-449-107  
General Industry Safety, 10-449-108

This program is fully eligible for financial aid.



## 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](http://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.*

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-449-100 SAFETY MANAGEMENT** ...occupational health and safety management principles, systems and supporting techniques to initiate and/or improve an organization's safety management system. Included is a focus on job safety analysis and fault tree.

**10-449-101 REGULATORY COMPLIANCE** ...self-paced course providing an overview of occupational safety/health compliance procedures emphasizing areas such as hazard communication, lockout/tagout, confined space entry, personnel protective equipment, machine guarding, hand/portable tools, fire safety.

**10-449-102 ACCIDENT INVESTIGATION** ...in this course you will determine cause, uncover indirect accident causes, prevent similar accidents from occurring, document facts, provide information on costs and promote safety. In addition, you will learn how to train first line supervisors in the area of accident/incident investigation, and train employees how to report accidents/incidents. OSHA record keeping and corrective action will also be addressed within this course.

**10-449-103 INDUSTRIAL HYGIENE-INTRODUCTION\*** ...fault finding, with the emphasis on criticism and fact-finding, with the emphasis on locating potential hazards that can adversely affect safety and health will be analyzed. The course will also evaluate and assess safety and health risks associated with equipment, material, processes and activities. (Prerequisite: 10-804-110, Elem Algebra w/ Apps)

*\*This self-paced course emphasizes calibrating and operating industrial hygiene related equipment, sampling methods, collecting data and interpreting results. From this base knowledge, the student will be able to operate industrial hygiene equipment in a manufacturing environment and apply the results to reduce occupational exposures.*

**10-449-104 AUDITS AND INSPECTIONS** ...this course will examine the process that takes place during the planning, design and operational phases of the safety system. The student will learn how to conduct the monitoring function in an organization to locate and report existing and potential hazards having the capacity to cause accident in the workplace. They will see how to locate and interpret past injury and illness data and compare to current data.

**10-606-159 MATERIALS SCIENCE** ...engineering materials, material selection, the relationship between material structure and properties, and failure analysis for design improvement. Materials covered include; metallic, polymeric, ceramic, and composite/exotic.

**10-623-100 STANDARDS/REGULATIONS** ...role of standards and regulations to reduce work place hazards.

**10-623-101 QUALITY ASSURANCE-TECHSPAN** ...role of quality improvement in modern companies.

**10-623-102 SPC-TECHSPAN** ...basic concepts and tasks of collecting data, calculating values, and constructing control charts.

**10-623-103 QUALITY SYSTEMS-TECHSPAN** ...implementation of ISO 9000 standards to a manufacturing company.

**10-623-105 PRECISION MEASURE** ...you will be introduced to measurement tools and their uses. The courses provides hands-on activities using tools, reading prints and assessing measuring systems.

**10-623-106 INTERPRET ENGINEERING DRAWINGS** ...reading and interpreting industrial prints.

**10-623-107 MANUFACTURING PRACTICES** ...practices used by manufacturers to make their operations more competitive, efficient and cost effective.

**10-623-108 MANUFACTURING MATERIALS** ...classifications, properties and applications of the materials used in manufacturing.

**10-623-109 MANUFACTURING PROBLEM SOLVING** ...scientific method of identifying the root cause, common analysis and change generation techniques for a variety of manufacturing problems.

**10-623-111 MANUFACTURING PROCESSES** ...primary and secondary processes; tools and tooling. Used in manufacturing, forming and casting techniques and material removal processes; assembly, finishing and routing techniques.

**10-623-113 QUALITY DOCUMENTATION** ...ISO 9000, documentation, writing sampling plans, procedure writing, and customer needs evaluation.

**10-623-114 MATERIAL RESOURCE PLANNING** ...how manufacturers determine their need for resources, how the availability of resources affects capacity, and how resources are allocated.

**10-623-115 CUSTOMER/VENDOR RELATIONS/AUDITS** ...the quality department's role in customer relations, vendor certification programs, and performing internal and vendor audits.

**10-623-116 INSPECTION** ...advanced metrology and introduction to non-destructive examination.

**10-623-121 WORK MEASUREMENT** ...the learner will develop skills in designing workstations, developing better work methods, establishing work standards, balancing assembly lines, and estimating labor costs. The time study techniques you will use include predetermined time standard system, stopwatch, and work sampling.

**10-623-133 QUALITY ENGINEERING** ...planning for quality, quality of design, reliability, manufacture planning, and design of experiments. (Prerequisite: 10-804-118, Interm Algebra w Apps)

**10-623-161 FACILITIES PLANNING** ...this course will provide the student a practical means to use data to develop and improve plant and facility layouts and improve material handling methods that will yield higher production, lower costs, and/or improve quality and customer service.

**10-623-162 PROCESS IMPROVEMENT** ...this course will provide the student with the skills to go through the process from identifying cost reduction opportunities through installing the improved methods with the use of process improvement tools.

**10-623-163 EQUIPMENT JUSTIFICATION** ...student will develop the skills to collect data and prepare justification, assist in new equipment selection, installation, support and monitoring, and monitor equipment's preventive maintenance program.

**10-623-164 ERGONOMICS/WORKPLACE SAFETY** ...student will be able to identify, analyze, and recommend improvements to work areas minimizing work place injuries. Exposure to: ergonomic guidelines, cost analysis, benefits of ergonomic improvements and accident investigation.

**10-623-165 PROCESS PLANNING** ...instruction provides the student with the skills to take a new product from the design stage to production while meeting the product and quality specifications, and cost target requirements by determining production sequence, specifying required tools and equipment, and scheduling manpower and machinery in order to meet production dates.

# Apprenticeship

Offered at the Green Bay, Marinette and Sturgeon Bay campuses. For information in Green Bay: (920) 498-5444.  
For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

## What is Apprenticeship?

It is an earn-while-you-learn program of on-the-job training combined with related classroom instruction that is normally provided by the district technical college.

As an apprentice, students are trained under a written training agreement called an indenture. While indentured, the employer agrees to teach the student the skills of the trade and the apprentice agrees to learn the skills involved. Other conditions of the indenture, such as the length of training, amount of pay, the rate of periodic pay increases, and the related classroom hours are covered. An apprenticeship is one of the best ways to enter a skilled occupation.

## What is Involved?

An indentured apprentice works a regular workweek, is paid apprentice wages, and also attends paid-related instruction on a regularly scheduled basis. The apprentice's progress in both the on-the-job training and classroom instruction is evaluated and appropriate records are maintained.

There is no discrimination in any phase of apprenticeship employment and training.

Upon completion of the training program, apprentices will receive a certificate from the state of Wisconsin certifying each one as a completed apprentice. To protect the interests of all parties concerned and to assist in the enforcement of the various aspects of the agreement, the Wisconsin Department of Workforce Development, Bureau of Apprenticeship Standards, is given the responsibility of overall supervision of the apprenticeship program.

Apprenticeship is not an on-demand program. All applicants must apply to the programs through the respective committee or sponsor. The Apprenticeship Office at NWTC can assist with the application process. Contact the Apprenticeship office at: (920) 498-5682.

## What are the Qualifications for an Applicant?

The basic requirement is that the applicant be at least 16 years of age. In all cases, however, the applicant is also required to be a high school graduate or to have passed the high school equivalency test. Applicants are also required to take the Academic Skills Assessment test which is provided at Northeast Wisconsin Technical College or other trade-specific exam by committee.

Most employers and/or joint apprenticeship committees have approved selection standards with more exacting requirements. In some trades, the requirements for the applicant include one or two years of high school math. Some trades require that the applicant take an aptitude test.

## How Long Does it Take?

The length of the apprenticeship depends upon the skilled occupation involved. Apprentice programs vary from two to five years. The average program is four years in length.

## What Related Classroom Instruction is Involved?

The number of classroom hours range from 288 hours to 1,008 hours of paid-related instruction, depending upon the skilled occupation, with the average being 400 hours. This related instruction teaches the apprentice the theory behind the skills learned on the job. Apprentices are required to attend night school on their own time and at their own expense.

## Where is the Related Training Offered?

The Clayton J. Smits Apprenticeship Center of Northeast Wisconsin Technical College offers related classroom instruction at the Green Bay, Marinette, and Sturgeon Bay campuses.

## What is an Apprenticeable Occupation?

An apprenticeable occupation is clearly identified and commonly recognized throughout an industry. It involves manual, mechanical, or technical skills and knowledge that require a minimum of 2000 hours of on-the-job work experience. It also requires an average of 400 hours of paid-related classroom instruction to supplement the on-the-job training. The state of Wisconsin has recognized more than 300 apprenticeable occupations. Some of the occupations or fields served by NWTC are:

- Carpenter
- Early Childhood Education
- Electrician
  - Construction Electrician
  - Residential Electrician
  - Voice Data Video Technician
- Electrical/Instrumentation
- Industrial Electrician
- Foundry/Pattern Maker
- Instrumentation
- Machinist
  - Regular Machinist
  - Maintenance Machinist
  - Tool & Die
- Mason
  - Bricklayer
  - Block Layer
  - Cement Finisher
  - Plasterer
  - Tile Setter
- Machine Repair
- Mechanical Adjuster
- Maintenance Mechanic (Millwright)
- Industrial Maintenance Mechanic
- Industrial Pipefitter
- Plumber
- Sheet Metal
- Steamfitter
- ABC HVAC

### 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](http://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.

### How Do I Start?

Start by learning what you can about the skilled occupation in which you are interested. Talk to people who are in the occupation, both employers and employees, counselors at your high school, or the local technical college, employers' associations, and labor unions. Remember, looking for an apprenticeship is like looking for a job. Applications should be made directly with employers or joint apprenticeship committees.

If you are entering an occupation that involves action by a joint apprenticeship committee, it will be necessary for you to go through their selection and interview procedures. Very often a committee may maintain a waiting list of qualified applicants who passed the committee's selection procedures.

### What is an Apprenticeship Employer?

An employer must be an individual, a joint apprenticeship committee, an owner of a business, a company, or a corporation who can teach the skills involved in the occupation. All sponsors of indentured apprentices are equal opportunity employers.

### What are Apprentice Wages?

Wages in the various skilled occupations and localities vary; most apprentices start at approximately 50% of the current skilled rate.

The apprentice is on a progressive wage scale with increases every six months, so that during the program the apprentice will average 60% of the skilled rate.

### How Do I Get More Information?

For more information about a specific skilled occupation, contact:

#### Bureau of Apprenticeship Standards

2740 W. Mason Street  
P.O. Box 19042  
Green Bay, WI 54307-9042  
(920) 492-5618

#### Apprenticeship Coordinator

#### Trades & Technical Division

#### Northeast Wisconsin Technical College

2740 W. Mason Street  
P.O. Box 19042  
Green Bay, WI 54307-9042  
(920) 498-5704  
(800) 422-NWTC, Ext. 5704





# Architectural Technology

Program Code 106141

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Architectural Technology prepares students to become residential designers, and under the supervision of an architect or engineer, to produce construction documents for wood, steel, masonry and concrete commercial structures. The program also prepares students to work in many fields related to architecture and construction including cabinetry, estimating, structural steel, reinforced concrete as well as heating, ventilating, plumbing and electrical.

### Program Outcomes

- Develop architectural working drawings for commercial buildings using steel, concrete, and masonry.
- Develop residential working drawings to meet code and client criteria.
- Perform technical designs/calculations and produce drawings for electrical, plumbing, and heating/ventilating systems.
- Produce drawings and details for structural wood, steel, and concrete members and connections.
- Explain the design and construction process.
- Solve problems creatively and critically.
- Communicate architectural facts and ideas orally and in writing.
- Communicate architectural ideas graphically utilizing sketching techniques.
- Work as a team to produce group projects.
- Exercise a proper work ethic.
- Display a positive attitude toward their profession.
- Apply codes, manufacturers' standards, tables, and technical manuals in design and drafting of a structure.
- Apply mathematical principles and formulas and utilize structural load tables as applied to building construction.
- Coordinate building specifications with working drawings.
- Choose appropriate materials for use in building construction.
- Estimate the materials required to construct a residential building.
- Operate computer drafting hardware and software to produce architectural working drawings.

### Employment Potential

**Architectural Technician:** works under the direction and supervision of an architect or professional engineer, preparing working drawings for residential, commercial and industrial buildings.

**Building Materials Sales Person:** works in retail sales of building products in a building materials center.

**Building Mechanical Technician:** works under the direction and supervision of an architect or professional engineer, preparing working drawings for heating, plumbing, and electrical systems within a building.

**Shop Drawing Draftsperson:** works under the supervision of a professional engineer, developing fabrication and erection drawings for components used in construction.

**Structural Draftsperson:** works under the direction and supervision of an architect or professional engineer, preparing working drawings for steel, concrete, and wood building systems.

**Residential Designer:** works independently designing and drafting homes for building materials centers or residential contractors.

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

- Architect
- Building Inspector
- Senior Draftsperson
- Commercial or Industrial Estimator
- Structural Engineer
- Specification Writer
- Project Manager

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Architectural Technology on the College Math assessment is 50.
- High school background in mathematics, science, and industrial education and/or construction related experience.
- High school algebra or equivalent.
- Provide proficiency of Word, Excel, PowerPoint, Windows and the Internet.

### Curriculum

The Architectural Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 66 credits.

#### First Semester

Catalog No.	Description	Credits
10-614-210	Arch Principles	4
10-614-211	Arch Revit Intro	1
10-614-212	Arch CAD Intro	1
10-614-213	Bldg Materials	2
10-614-214	Bldg Green Intro	1
10-801-195	Written Communication	3
10-804-118	Interm Algebra w Apps	4
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-614-230	Arch Residential	4
10-614-231	Arch Revit Advanced	2
10-614-232	Struct Residential	2
10-804-196	Trigonometry w Apps	3
10-809-172	Race Ethnic & Diversity	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-614-250	Arch Comm Studio I	4
10-614-251	Bldg Estimating	2
10-614-252	Arch Bldg Science	2
10-614-253	Struct Commercial	3
10-614-254	Bldg Green Res	1
10-801-197	Technical Reporting	3
10-804-195	College Algebra w Apps	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-614-270	Arch Comm Studio II	4
10-614-271	Struct Analysis	3
10-614-272	Bldg MEP Systems	3
10-614-273	Bldg Green Comm	1
	Elective	4
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>66</b>

#### Suggested Electives:

Land Survey/Site Development, 10-607-106  
Archi Construction Experiences, 10-614-148  
CAD Advanced Architectural, 10-614-149  
Architectural-Sustainable, 10-614-109

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-614-210 ARCHITECTURAL PRINCIPLES

...establishes a background in graphic communication and the field of architecture. Creation, interpretation, and effective use of construction documents and specifications will be examined. Basic architectural sketches and drawings will be prepared. (Prerequisite: Accepted into Architectural; Corequisites: 10-614-211, Arch Revit Intro; 10-614-213, Bldg Materials)

### 10-614-211 ARCHITECTURAL REVIT INTRODUCTION

...introduces the parametric design software Autodesk Revit used for building information modeling. Basic design and documentation tools will be employed. A simple building design will be modeled that matches given specifications. (Prerequisite: Accepted into Architectural)

### 10-614-212 ARCHITECTURAL CAD INTRO

...incorporates the use of AutoCAD for generating building details. Basic to intermediate CAD commands will be covered as they relate to architectural drawings. Accurate drawings that incorporate symbols, dimensions and notes will be created. (Prerequisite: Accepted into Architectural)

**10-614-213 BUILDING MATERIALS** ...considers material properties, processes of manufacture, installation procedures and performance. Construction methods, building systems and products will be evaluated. Materials will be analyzed and classified based on the Construction Specifications Institute Master Format. (Prerequisite: Accepted into Architectural)

### 10-614-214 BLDG GREEN INTRODUCTION

...summarizes the history, technology and science underlying sustainable building practices. The human factor and the economics of sustainability will be discussed. Alternative energy including wind, solar, photovoltaic, geothermal and fuel cells will be researched. (Prerequisite: Accepted into Architectural; Corequisites: 10-614-210, Arch Principles; 10-614-213, Bldg Materials)

### 10-614-230 ARCHITECTURAL RESIDENTIAL

...emphasizes residential house styles, building codes, and design components related to the site and structure. Conceptual designs of single family residences will be planned collaboratively. Construction drawings will be produced using Autodesk Revit design software. (Prerequisites: 10-614-210, Arch Principles; 10-614-211, Arch Revit Intro; 10-614-213, Bldg Materials; Corequisites: 10-614-231, Arch Revit Adv; 10-614-232, Struct Residential; 10-804-118, Interm Algebra w Apps)

### 10-614-231 ARCHITECTURAL REVIT ADVANCED

...expands the implementation of additional features found in the parametric design software Autodesk Revit. Advanced modeling and documentation tools will be explored. More complex building information models will be generated, edited and documented. (Prerequisite: 10-614-211, Arch Revit Intro)

### 10-614-232 STRUCTURAL RESIDENTIAL

...highlights load distribution and coordination of structural components within residential buildings. Foundation systems, framing design and applicable codes will be examined. Various methods will be utilized to select members for use in structural drawings. (Prerequisites: 10-614-210, Arch Principles; 10-614-213, Bldg Materials; 10-614-212, Arch CAD Intro; Corequisites: 10-614-231, Arch Revit Adv; 10-614-230, Arch Residential; 10-804-118, Interm Algebra w Apps)

### 10-614-250 ARCHITECTURAL COMM STUDIO I

...outlines working drawing documentation and the construction process of commercial projects. Advanced building information modeling tools will be applied to a steel frame and masonry structure. Plans, elevations, sections and detail will be generated. (Prerequisites: 10-614-230, Arch Residential; 10-614-231, Arch Revit Adv; Corequisite: 10-614-253, Struct Commercial)

**10-614-251 BUILDING ESTIMATING** ...applies mathematics and the knowledge of building materials to the art of blueprint interpretation. Residential and commercial construction plans will be referenced. Manual and computerized methods will be employed to complete material quantity surveys. (Prerequisites: 10-614-230, Arch Residential; 10-614-232, Struct Residential; 10-804-196, Trigonometry w Apps)

### 10-614-252 ARCHITECTURAL BUILDING SCIENCE

...relates fundamental concepts of physics to architectural design and building construction. Critical thinking will be necessary to perform various calculations. Physical properties of building materials and systems will be analyzed through demonstrations and experiments. (Prerequisites: 10-614-230, Arch Residential; 10-614-232, Struct Residential; 10-804-196; Trigonometry w Apps)

**10-614-253 STRUCTURAL COMMERCIAL** ...interprets information necessary to communicate the structural design of commercial buildings. Concrete, masonry and steel structural systems will be compared. Engineering sketches, industry manuals and computers will be utilized to prepare required details.

(Prerequisites: 10-614-230, Arch Residential; 10-614-232, Struct Residential; 10-614-231, Arch Rev Adv; 10-614-212, Arch CAD Intro; Corequisite: 10-614-250, Arch Comm Studio I)

### 10-614-254 BUILDING GREEN RESIDENTIAL

...investigates basic sustainable design theory. The energy concepts of an extrinsically loaded house, natural building materials, and alternative technologies will be explored. Green building principles will be employed to design a home. (Prerequisites: 10-614-230, Arch Residential; 10-614-231, Arch Revit Adv; 10-614-214, Bldg Green Intro)

**10-614-270 ARCH COMM STUDIO II** ...integrates content from previous program courses while discovering the professional practice of architecture. Reinforced and precast concrete framed building structures will be highlighted. A set of commercial working drawings will be developed. (Prerequisites: 10-614-250, Arch Comm Studio I; 10-614-253, Struct Commercial)

**10-614-271 STRUCTURAL ANALYSIS** ...explains mathematical interaction between static's and strength of materials. Principles of structural theory will be applied to beam and column design. Basic calculations will be performed to relate concepts to actual wood member conditions. (Prerequisites: 10-804-195, College Algebra w Apps; 10-614-252, Arch Bldg Science)

**10-614-272 BUILDING MEP SYSTEMS** ...correlates the relationship between a building and its mechanical, electrical and plumbing systems. Codes, space requirements and specifications will be related to the building. MEP plans and necessary calculations will be prepared for a building. (Prerequisites: 10-614-252, Arch Bldg Science; 10-614-231, Arch Revit Adv; 10-614-212, Arch CAD Intro)

### 10-614-273 BUILDING GREEN COMMERCIAL

...evaluates green building performance. Sustainable sites, energy, materials and day lighting will be considered. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System will be utilized to design an environmentally friendly building. (Prerequisites: 10-614-250, Arch Comm Studio I; 10-614-254, Bldg Green Res)

# Auto Collision Repair and Refinishing Technician Program Code 324051

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Auto Collision Repair and Refinishing Technician prepares students to repair and refinish damaged bodies and parts of automobiles and light trucks.

### Program Outcomes

- Straighten damaged autobody sheetmetal.
- Repair plastic and composite body parts.
- Refinish automobile body parts.
- Repair and replace stationary glass.
- Repair damaged automobile and light truck frames.
- Repair unibody structural damage.
- Estimate collision damage repair costs.
- Demonstrate Auto Collision welding procedures.
- Repair manual and passive restraint systems.
- Diagnose problems in automotive electrical, electronic, and mechanical systems.
- Repair steering and suspension systems.
- Qualify for Automotive Service Excellence Autobody and Paint Certification Exam.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and technology education.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Accreditation

- NATEF (National Automotive Technicians Education Foundation) Certified Program
- I-CAR Automotive Steel GMA (MIG) Welding Qualification test site
- STAR - Spray Technique Analysis and Research training site
- Auto Glass Technical Institute (AGTI) affiliated provider
- I-CAR Industry Training Alliance Member
- AGRESS (Auto Glass Replacement Safety Standards Council) Certified

### Associations

- National Institute for Automotive Service Excellence
- Wisconsin Auto Collision Technicians Association
- Bay Auto Body Association
- National Auto Body Congress
- Collision Repair Instructors Network

### Employment Potential

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

**Auto Collision Repair Technician:** Repairs damaged bodies of cars and light trucks; removes damaged panels and welds in new ones; removes and replaces accessories, glass, electrical parts, and interior trim; repairs or replaces plastic or composite parts; and straightens dents in sheet metal panels to restore the vehicle to pre-accident condition.

**Auto Collision Refinishing Technician:** Completes the refinishing phase of all repairs on cars, trucks, and fleet vehicles; does all stages of priming, sanding and sealing prior to the paint application; determines the type and color of paint to do the refinishing; is familiar with mixing, tinting, and shading; as well as the application of color for matching; and buffs, polishes, stripes, and details vehicle to complete the repair job.

**Frame and Alignment Technician:** Straightens, welds, replaces, and aligns all types of frames and suspensions of cars and trucks to restore them to factory specifications.

**Unibody Repair Specialist:** Repairs unitized vehicles by analyzing, measuring, and pulling the unibody structure to the proper dimensions; and replaces structural parts that are not repairable using proper structural parts-sectioning techniques to return the vehicle to factory specifications.

**Trim and Glass Installer:** Removes, replaces, or repairs all types of glass or glass-related problems on vehicles.

### Credentials

All NWTC Auto Collision programs are ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards. Additionally, all instructional staff in the NWTC Auto Collision Programs are, at a minimum, Master, ASE Certified Technicians.

NWTC Auto Collision Program National Award: The Northeast Wisconsin Technical College Auto Collision Repair & Refinishing Program received a National Award of Excellence from the Auto Industry Planning Council (AIPC) in 2006.

### Note

The sequence course offering of both 10-405-100 and 10-405-102 may be completed as a substitute to the sequence course offering of both 10-405-101 and 10-405-103. Completion of either of these sequence offerings will satisfy the program course prerequisite.

This program is fully eligible for financial aid.

### Curriculum

The Auto Collision Repair and Refinishing Technician Technical Diploma is a two-year program. Upon graduation, a student will have completed 54 credits. The two NWTC Auto Collision, Repair and Refinishing programs are organized in a "series" of courses. The two series are: Repair and Refinishing. Both series of courses must be completed in which ever program (associate degree or technical diploma) the student elects to pursue. A student can start in either program (associate degree or technical diploma) at the beginning of either series of classes or when prerequisites are fulfilled.

#### Auto Collision Refinishing—First Series

10-405-101	Auto Collision Ref-Intro	1
OR		
10-405-100	Auto Body Repair-Intro	1
10-405-103	Auto Collision Repair	1
OR		
10-405-102	Auto Body/Restoration-Basic	1
10-405-105	Auto Collision-Plas/Comp	2
10-405-109	Auto Refinish Surface Prep	2
10-405-113	Auto Collision Refinish App	3
10-405-117	Auto Collision Detailing	1
10-804-106	Intro to College Math	3
31-801-385	Communicating-Writing	1
32-405-320	Auto Collision Ind Shadow	1
<b>First Series Credits</b>		<b>17</b>

#### Auto Collision Refinishing—Second Series

10-103-111	Micro: Windows-Intro	1
10-103-121	Micro: Word-Intro	1
10-405-120	Auto Collision Finish Def	2
10-405-124	Auto Refinishing-Advanced	3
10-405-128	Auto Color Adjustment/Tint	3
10-809-197	Contemporary Amer Society	3
<b>Second Series Credits</b>		<b>13</b>

#### Auto Collision Repair—First Series

10-405-107	Auto Collision Trim/Hdware	1
10-405-111	Auto Glass/Hardware	2
10-405-115	Auto Collision Non-Struct	3
10-405-144	Auto Collision Welding	2
10-602-110	Auto Collision Mechanical Serv	3
31-801-386	Communicating Effectively	1
<b>First Series Credits</b>		<b>12</b>

#### Auto Collision Repair—Second Series

10-405-122	Auto Collision Damage Analy	2
10-405-126	Auto Collision Structural	3
10-405-130	Auto Collision Sectioning	3
10-405-135	Auto Collision Damage Rptrs	1
10-405-146	Auto Collision Welding-Adv	2
10-602-117	Wiring/Schematics Tech	1
10-602-118	DC Electricity Technology	1
10-602-119	Auto Collision Electronics	1
<b>Second Series Credits</b>		<b>14</b>
<b>Total Credits</b>		<b>54</b>

## Please Note

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- 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.*

**10-405-100 AUTO BODY REPAIR** ...safety, minor dent repair, abrasives, fillers, undercoats, topcoats, uses classroom and shop presentation. Information applied by students on projects provided, metal finishing, and straightening.

**10-405-101 AUTO COLLISION REFINISH-INTRODUCTION** ...industry career opportunities and certifications, refinishing safety and environmental regulations, automotive paints, and paint application equipment.

**10-405-102 AUTO BODY/RESTORATION-BASIC** ...body shop safety, shop materials, basic metal straightening, rust repair, rustout panel replacement and refinishing. Information presented will be applied by students on projects provided by students. (Corequisite: 10-405-100, Auto Body Repair; or 47-405-461, Auto Body Introduction, OR instructor approval.)

**10-405-103 AUTO COLLISION REPAIR** ...industry career opportunities, expectations, and certifications, personal and shop safety, sheet metal characteristics and analysis, safe equipment use during basic repair procedures on dents and rust, sheet metal patch fabrication and installation, corrosion protection.

**10-405-105 AUTO COLLISION-PLASTICS/COMPOSITES** ...identification of automotive plastics, making repair or replace decisions, repair of plastics by plastic welding and the use of adhesives, and retexturing and refinishing of plastics and composites. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-107 AUTO COLLISION TRIM/HARDWARE** ...safe removal and replacement procedures of: exterior and interior trim, restraint systems, vinyl tops and convertible tops, utilizing the correct tools, and industry accepted procedures.

**10-405-109 AUTO REFINISHING SURFACE PREP** ...planning the refinishing process, paint removal, cleaning and metal conditioning, sanding, masking, preparing adjacent panels for blending, and application of stone resistant materials. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-111 AUTOMOBILE GLASS/HARDWARE** ...glass types, functions, performance, tools, air and water leak diagnosis and repair, safe repair, and replacement procedures for auto glass, and their related components; utilizing industry accepted procedures.

**10-405-113 AUTO COLLISION REFINISH APPLICATION** ...the painting environment, using air supply equipment, mixing paint, and the application of undercoats and topcoats. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-115 AUTO COLLISION NON-STRUCTURAL** ...vehicle construction, part identification, non-structural damage analysis, repair sequence planning, non-structural panel replacement procedures and tool use, non-structural panel repair procedures, corrosion protection, and time management skills for repair procedures. (Prerequisite: 10-405-103, Auto Collision Repair; Corequisite: 10-405-107, Auto Collision Trim/Hardware)

**10-405-117 AUTO COLLISION DETAILING** ...proper vehicle detailing, including interior cleaning, engine compartment cleaning, exterior cleaning, repairing minor surface defects and buffing, and application of decals, stripes and graphics.

**10-405-120 AUTO COLLISION FINISH DEFECTS** ...diagnosis and repair of finish defects, including contamination defects, spray technique defects, drying and curing problems, defects from improper preparation, environmental damage, and paint film failures. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-109, Auto Surface Prep for Collision Refinishing; 10-405-113, Auto Collision Refinish Application Systems)

**10-405-122 AUTO COLLISION DAMAGE ANALYSIS** ...vehicle construction, collision forces, structural damage analysis, measuring equipment, damage diagnosis, and repair planning.

**10-405-124 AUTO REFINISHING-ADVANCED** ...advanced vehicle refinishing techniques including blending, tri-coat finishes, and custom painting. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-109, Auto Surface Prep for Collision Refinishing; 10-405-113, Auto Collision Refinish Application Systems)

**10-405-126 AUTO COLLISION STRUCTURAL** ...hydraulic pulling systems, pulling procedures, stress relieving, steel types, straightening procedures for front, rear, side and roof damage, and frame and suspension alignment. (Prerequisites: 10-405-107, Collision Trim/Hardware; 10-405-111, Auto Glass/Hardware; 10-405-115, Collision Non-Structural; 10-405-122, Collision Damage Analysis; 10-405-144, Collision Welding; 10-602-110, Collision Mech Serv)

**10-405-128 AUTO COLOR ADJUSTMENT/TINT** ...color theory, color movement, color adjustment and testing color match. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-113, Auto Collision Refinish Appl Systems)

**10-405-130 AUTO COLLISION SECTIONING** ...full structural panel replacement guidelines and procedures, partial structural panel guidelines and procedures, sectioning joints required in replacement of: quarter panels, front rails, rear rails, rocker panels, A-pillars, B-pillars, floor panels, and full body sectioning. (Prerequisites: 10-405-103, Auto Collision Rep; 10-405-107, Collision Trim/Hardware; 10-405-111, Auto Glass/Hardware; 10-405-115, Collision Non-Structural; 10-405-122, Collision Damage Analysis; 10-405-144, Collision Welding; 10-602-110 Collision Mech Serv)

**10-405-135 AUTO COLLISION DAMAGE REPORTS** ...vehicle body construction, damage analysis, vehicle identification, reference manuals, and writing damage reports both manually and with the aid of a computer.

**10-405-144 AUTO COLLISION WELDING** ...welding processes, machines and accessories, gas metal arc welding (wire), oxyacetylene cutting, welding and brazing, and gas tungsten arc welding.

**10-405-146 AUTO COLLISION WELDING-ADVANCED** ...advanced welding procedures necessary for an Auto Collision Repair Technician, including GTAW on aluminum along with GMAW on 1/8 inch thick or thicker steel.

**10-602-110 AUTO COLLISION MECHANICAL SERVICE** ...automotive systems diagnostic, repair and adjustment procedures covering commonly effected areas of the automobile regularly repaired by an Auto Collision Technician.

**10-602-117 WIRING/SCHEMATICS TECHNOLOGY** ...electrical symbols, wiring diagrams, tracing wiring circuits, and diagnosing electrical problems with wiring diagrams, \*design an automotive electrical circuit. (Corequisite: 10-602-118, DC Electricity Tech)

**10-602-118 DC ELECTRICITY TECHNOLOGY** ...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism, \*research paper comparing and contrasting A/C and D/C electrical applications.

**10-602-119 AUTO COLLISION ELECTRONICS** ...electrical circuit diagnosis, troubleshooting and repair of commonly effected circuits that an Auto Collision Technician will encounter.

**32-405-320 AUTO COLLISION INDUSTRY SHADOWING** ...an opportunity to experience the auto collision industry working environment. Course will facilitate student's opportunities to meet technicians and shop owners, and to observe all facets of the industry.



# Auto Collision Repair and Refinish Technology Program Code 104051

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

This two-year program provides all the required technical training that the technical diploma offers. It also provides the student with the opportunity to pursue a supervisory or management career, to pursue an automotive industry related career, and to transfer credit to a four-year college.

Students will gain the experience of observing the various management positions that are available to them. The added experience of the management positions will allow the graduate to increase their value to the Auto Collision Repair and Refinishing Industry. The Auto Collision Repair and Refinishing Technology Associate Degree will also provide the student with the opportunity to transfer credit to a four-year college, and pursue an automotive industry related career.

### Program Outcomes

- Straighten damaged autobody sheetmetal.
- Repair plastic and composite body parts.
- Repair and replace stationary glass.
- Repair damaged automobile and light truck frames.
- Refinish automobile body parts.
- Repair unibody structural damage.
- Estimate collision damage repair costs.
- Demonstrate Auto Collision welding procedures.
- Repair manual and passive restraint systems.
- Diagnose problems in automotive electrical, electronic, and mechanical systems.
- Repair steering and suspension systems.
- Qualify for Automotive Service Excellence Autobody and Paint Certification Exam.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and technology education.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Credentials

All NWTC Auto Collision programs are ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards. Additionally, all instructional staff in the NWTC Auto Collision Programs are, at a minimum, Master, ASE Certified Technicians.

NWTC Auto Collision Program National Award: The Northeast Wisconsin Technical College Auto Collision Repair & Refinishing Program received a National Award of Excellence from the Auto Industry Planning Council (AIPC) in 2006.

### Employment Potential

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

**Insurance Adjuster/Appraiser:** Works closely with collision repair facilities to negotiate repair procedures and repair costs.

**Collision Center Owner:** Owns and operates their own collision repair facility. May have several employees working for them.

**Collision Center Manager:** Oversees all aspects of the collision center operation; including writing estimates, working with insurance companies, and managing employees.

**Manufacturers Representative:** Represents various manufacturers of paint and body supplies in either sales or as a technical representative.

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

- Tech-Ed Teacher
- Collision Repair and Refinishing Instructor
- Automotive Engineer
- Insurance Adjuster or Appraiser

### Accreditations

- NATEF (National Automotive Technicians Education Foundation) Certified Program
- I-CAR Automotive Steel GMA (MIG) Welding Qualification test site
- STAR - Spray Technique Analysis and Research training site
- Auto Glass Technical Institute (AGTI) affiliated provider
- I-CAR Industry Training Alliance Member
- AGRESS (Auto Glass Replacement Safety Standards Council) Certified

### Associations

- National Institute for Automotive Service Excellence
- Wisconsin Auto Collision Technicians Association
- Bay Auto Body Association
- National Auto Body Congress
- Collision Repair Instructors Network

### Note

The sequence course offering of both 10-405-100 and 10-405-102 may be completed as a substitute to the sequence course offering of both 10-405-101 and 10-405-103. Completion of either of these sequence offerings will satisfy the program course prerequisite.

### Curriculum

The Auto Collision Repair and Refinish Technology Associate Degree is a two-year program. Upon graduation, a student will have completed 64 credits. The two NWTC Auto Collision, Repair and Refinishing programs are organized in "series" of courses. The two series are: Repair and Refinishing. Both series of courses must be completed in which ever program (associate degree or technical diploma) the student elects to pursue. A student can start in either program (associate degree or technical diploma) at the beginning of either series of classes or when prerequisites are fulfilled.

#### Auto Collision Refinishing—First Series

Catalog No.	Description	Credits
10-405-101	Auto Collision Ref-Intro	1
OR		
10-405-100	Auto Body Repair-Intro	1
10-405-103	Auto Collision Repair	1
OR		
10-405-102	Auto Body/Restoration-Basic	1
10-405-105	Auto Collision-Plas/Comp	2
10-405-109	Auto Refinish Surface Prep	2
10-405-113	Auto Collision Refinish App	3
10-405-117	Auto Collision Detailing	1
10-801-195	Written Communication	3
10-804-106	Intro to College Math	3
<b>First Series Credits</b>		<b>16</b>

#### Auto Collision Refinishing—Second Series

10-405-120	Auto Collision Finish Def	2
10-405-124	Auto Refinishing-Advanced	3
10-405-128	Auto Color Adjustment/Tint	3
10-801-196	Oral/Interpersonal Comm	3
10-809-197	Contemporary Amer Society	3
<b>Second Series Credits</b>		<b>14</b>

#### Auto Collision Repair—First Series

10-405-107	Auto Collision Trim/Hdware	1
10-405-111	Auto Glass/Hardware	2
10-405-115	Auto Collision Non-Struct	3
10-405-144	Auto Collision Welding	2
10-602-110	Auto Collision Mechanical Serv	3
10-801-197	Technical Reporting	3
10-809-199	Psychology Of Human Relations	3
<b>First Series Credits</b>		<b>17</b>

#### Auto Collision Repair—Second Series

10-405-122	Auto Collision Damage Analy	2
10-405-126	Auto Collision Structural	3
10-405-130	Auto Collision Sectioning	3
10-405-135	Auto Collision Damage Rpts	1
10-405-146	Auto Collision Welding-Adv	2
10-602-117	Wiring/Schematics Tech	1
10-602-118	DC Electricity Technology	1
10-602-119	Auto Collision Electronics	1
10-809-172	Race Ethnic & Diversity	3
<b>Second Series Credits</b>		<b>17</b>
<b>Total Credits</b>		<b>64</b>

This program is fully eligible for financial aid.



## 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](http://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.*

**10-405-100 AUTO BODY REPAIR** ...safety, minor dent repair, abrasives, fillers, undercoats, topcoats, uses classroom and shop presentation. Information applied by students on projects provided, metal finishing, and straightening.

**10-405-101 AUTO COLLISION REFINISH-INTRODUCTION** ...industry career opportunities and certifications, refinishing safety and environmental regulations, automotive paints, and paint application equipment.

**10-405-102 AUTO BODY/RESTORATION-BASIC** ...body shop safety, shop materials, basic metal straightening, rust repair, rustout panel replacement and refinishing. Information presented will be applied by students on projects provided by students. (Corequisite: 10-405-100, Auto Body Repair; or 47-405-461, Auto Body Introduction, OR instructor approval.)

**10-405-103 AUTO COLLISION REPAIR** ...industry career opportunities, expectations, and certifications, personal and shop safety, sheet metal characteristics and analysis, safe equipment use during basic repair procedures on dents and rust, sheet metal patch fabrication and installation, corrosion protection.

**10-405-105 AUTO COLLISION-PLASTICS/COMPOSITES** ...identification of automotive plastics, making repair or replace decisions, repair of plastics by plastic welding and the use of adhesives, and retexturing and refinishing of plastics and composites. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-107 AUTO COLLISION TRIM/HARDWARE** ...safe removal and replacement procedures of: exterior and interior trim, restraint systems, vinyl tops and convertible tops, utilizing the correct tools, and industry accepted procedures.

**10-405-109 AUTO REFINISHING SURFACE PREP** ...planning the refinishing process, paint removal, cleaning and metal conditioning, sanding, masking, preparing adjacent panels for blending, and application of stone resistant materials. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-111 AUTOMOBILE GLASS/HARDWARE** ...glass types, functions, performance, tools, air and water leak diagnosis and repair, safe repair, and replacement procedures for auto glass, and their related components; utilizing industry accepted procedures.

**10-405-113 AUTO COLLISION REFINISH APPLICATION** ...the painting environment, using air supply equipment, mixing paint, and the application of undercoats and topcoats. (Corequisite: 10-405-101, Auto Collision Refinishing Intro)

**10-405-115 AUTO COLLISION NON-STRUCTURAL** ...vehicle construction, part identification, non-structural damage analysis, repair sequence planning, non-structural panel replacement procedures and tool use, non-structural panel repair procedures, corrosion protection, and time management skills for repair procedures. (Prerequisite: 10-405-103, Auto Collision Repair; Corequisite: 10-405-107, Auto Collision Trim/Hardware)

**10-405-117 AUTO COLLISION DETAILING** ...proper vehicle detailing, including interior cleaning, engine compartment cleaning, exterior cleaning, repairing minor surface defects and buffing, and application of decals, stripes and graphics.

**10-405-120 AUTO COLLISION FINISH DEFECTS** ...diagnosis and repair of finish defects, including contamination defects, spray technique defects, drying and curing problems, defects from improper preparation, environmental damage, and paint film failures. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-109, Auto Surface Prep for Collision Refinishing; 10-405-113, Auto Collision Refinish Application Systems)

**10-405-122 AUTO COLLISION DAMAGE ANALYSIS** ...vehicle construction, collision forces, structural damage analysis, measuring equipment, damage diagnosis, and repair planning.

**10-405-124 AUTO REFINISHING-ADVANCED** ...advanced vehicle refinishing techniques including blending, tri-coat finishes, and custom painting. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-109, Auto Surface Prep for Collision Refinishing; 10-405-113, Auto Collision Refinish Application Systems)

**10-405-126 AUTO COLLISION STRUCTURAL** ...hydraulic pulling systems, pulling procedures, stress relieving, steel types, straightening procedures for front, rear, side and roof damage, and frame and suspension alignment. (Prerequisites: 10-405-107, Collision Trim/Hrdware; 10-405-111, Auto Glass/Hrdware; 10-405-115, Collision Non-Structural; 10-405-122, Collision Damage Analysis; 10-405-144, Collision Welding; 10-602-110 Collision Mech Serv)

**10-405-128 AUTO COLOR ADJUSTMENT/TINT** ...color theory, color movement, color adjustment and testing color match. (Prerequisites: 10-405-101, Auto Collision Refinishing Intro; 10-405-113, Auto Collision Refinish Appl Systems)

**10-405-130 AUTO COLLISION SECTIONING** ...full structural panel replacement guidelines and procedures, partial structural panel guidelines and procedures, sectioning joints required in replacement of: quarter panels, front rails, rear rails, rocker panels, A-pillars, B-pillars, floor panels, and full body sectioning. (Prerequisites: 10-405-103, Auto Collision Rep; 10-405-107, Collision Trim/Hrdware; 10-405-111, Auto Glass/Hrdware; 10-405-115, Collision Non-Structural; 10-405-122, Collision Damage Analysis; 10-442-144, Collision Welding; 10-602-110 Collision Mech Serv)

**10-405-135 AUTO COLLISION DAMAGE REPORTS** ...vehicle body construction, damage analysis, vehicle identification, reference manuals, and writing damage reports both manually and with the aid of a computer.

**10-405-144 AUTO COLLISION WELDING** ...welding processes, machines and accessories, gas metal arc welding (wire), oxyacetylene cutting, welding and brazing, and gas tungsten arc welding.

**10-405-146 AUTO COLLISION WELDING-ADVANCED** ...advanced welding procedures necessary for an Auto Collision Repair Technician, including GTAW on aluminum along with GMAW on 1/8 inch thick or thicker steel.

**10-602-110 AUTO COLLISION MECHANICAL SERVICE** ...automotive systems diagnostic, repair and adjustment procedures covering commonly effected areas of the automobile regularly repaired by an Auto Collision Technician.

**10-602-117 WIRING/SCHEMATICS TECHNOLOGY** ...electrical symbols, wiring diagrams, tracing wiring circuits, and diagnosing electrical problems with wiring diagrams. \*design an automotive electrical circuit. (Corequisite: 10-602-118, DC Electricity Tech)

**10-602-118 DC ELECTRICITY TECHNOLOGY** ...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism, \*research paper comparing and contrasting A/C and D/C electrical applications.

**10-602-119 AUTO COLLISION ELECTRONICS** ...electrical circuit diagnosis, troubleshooting and repair of commonly effected circuits that an Auto Collision Technician will encounter.

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Automation Engineering Technology program responds to industry's need for system-level technicians who can work with integrated machine systems that might involve industrial automation, robotics, mechanics, computers, industrial communications and/or electronics technology. These technicians are in high demand to coordinate the higher end control platforms and networking that support automated mechanical systems.

### Program Outcomes

- Understand and apply knowledge of electricity, electronics and motors to industrial applications.
- Read and interpret technical specifications, detail and assembly drawings, schematics, and diagrams for machine control.
- Document technical information through descriptive writing, sketches/diagrams, mathematical expression, computation, and graphs.
- Analyze electrical, mechanical, fluid control functions for proper machine programming and operation.
- Apply a variety programming languages to the control of single manufacturing cells, programmable controllers, computer networks, industrial networks, and information systems using a dynamic data exchange.
- Construct ladder diagrams, flow charts, timing diagrams, and basic computer control algorithms for machine control.
- Understand and apply computer hardware/software applications to industrial systems.
- Apply diagnostic tools to troubleshoot and resolve system problems.
- Apply critical thinking skills to solving problems.
- Effectively communicate and perform in a team environment.

### Employment Potential

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

- Controls Designer
- Automation Technician
- Controls Technician
- Engineering Technician
- Controls Engineer in Training
- Automation Engineer in Training

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Automation Engineering Technology on the College Math assessment is 50.
- Beginning courses require mastery of algebra skills. For a description of algebra skills, see the Basic Education section of this catalog.

### Curriculum

The Automation Engineering Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 62 credits.

#### First Semester

Catalog No.	Description	Credits
10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
10-660-101	Digital 1: Logic	1
10-660-102	Digital 2: Sequential	1
10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-664-100	Automation 1: Control Logic	1
10-664-101	Automation 2: Motor Control	1
10-804-118	Interm Algebra w Apps	4
10-809-198	Intro to Psychology	3
	Elective	1
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-620-140	Machine Wiring and Safety	1
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-110	Electronics 1: Diodes-Basic	1
10-660-111	Electronics 2: Trans-Basic	1
10-664-102	Automation 3: PLC	1
10-664-103	Automation 4: PLC	1
10-664-104	Automation 5: PLC	1
10-804-196	Trigonometry w Apps	3
10-806-143	College Physics 1	3
	Elective	1
<b>Semester Total</b>		<b>15</b>

#### Third Semester

10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Drives	1
10-620-159	Power Electronics 3: Drives	1
10-620-161	Power Electricity 1: Motors	1
10-620-162	Power Electricity 2: Motors	1
10-664-105	Automation 6: PLC	1
10-664-109	Automation CAD 1	1
10-664-110	Automation CAD 2	1
10-664-151	Automation 8: HMI	1
10-664-152	Automation 9: HMI	1
10-664-160	Control 1: Discrete Systems	1
10-664-161	Control 2: Process Systems	1
10-664-162	Control 3: Motion Systems	1
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-620-170	Robotics - Introduction to	1
10-664-150	Automation 7: PLC	1
10-664-153	Automation 10: Network	1
10-664-163	Control 4: Drive Performance	1
10-664-164	Control 5: Servo Systems	1
10-664-165	Control 6: Servo Systems	1
10-664-189	Automation Systems Integration	3
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>62</b>

This program is fully eligible for financial aid.

## 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](http://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.*

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics and applications of thyristors, power transistors, and switching devices. (Prerequisite: 10-660-107, AC 1: Properties)

**10-605-158 POWER ELECTRONICS 2: DRIVES** ...power circuitry of AC and DC drives and basic setup and application of an industrial DC and AC drives to DC and AC motors. (Corequisite: 10-605-157, Power Electronics 1: Devices)

**10-620-100 FLUIDS 1: BASIC PNEUMATICS** ...what fluid power is, differentiate between hydraulics and pneumatics, implement basic pneumatic circuits, utilize schematics, apply Pascal's law, define properties of fluids, implement airflow control and hydraulics cylinder circuits.

**10-620-101 FLUIDS 2: BASIC HYDRAULICS** ...hydraulic pumps, basic hydraulics actuator circuits, hydraulic schematics, apply Pascal's Law, summarize the effects of fluids friction, define properties of hydraulic energy, design hydraulic circuits with directional control valves. (Corequisite: 10-620-100, Fluids 1: Basic Pneumatics)

### 10-620-140 MACHINE WIRING AND SAFETY

...introduction to machine wiring, including basic documentation, labeling, and wiring practices; and an overview of NFPA 70 - machinery, safety and installation standards.

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC drives and application of industrial AC drives to AC motors. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ...DC motors and generator configuration, shunt, compound, and permanent magnet DC motor performance and characteristics.

**10-620-162 POWER ELECTRICITY 2: MOTORS** ...series DC, Compound DC, AC Induction, and Specialty machine performance and characteristics, and three-phase power systems. (Corequisite: 10-620-161, Power Electricity 1: Motors)

### 10-620-170 ROBOTICS - INTRODUCTION TO

...introductory study of the application, operation, programming and troubleshooting of Industrial Robots. (Prerequisite: 10-664-160, Control 1: Transducers or 10-605-165, Micro 3: Interfaces)

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operation using switch logic, ladder logic, and gate logic. Simplification methods using Boolean theorems and Karnaugh Maps, and timing diagram analysis.

**10-660-102 DIGITAL 2: SEQUENTIAL** ...operation and connection of Latches, RS flip-flops, JK flip-flops, and D flip-flops using timing diagram analysis, and some simple applications are studied. (Prerequisite: 10-660-101, Digital 1: Logic)

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, Current, Resistance, Ohm's Law, Power and Kirchhoff's Voltage Law are defined.

**10-660-105 DC 2: CIRCUITS** ...analysis of parallel and series-parallel circuits. Application of Kirchhoff's Current Law to parallel circuit combinations. Introduction of current sources and source conversions. (Corequisites: 10-804-118, Interm Algebra w Apps or equivalent; 10-660-104, DC 1: Intro)

**10-660-107 AC 1: PROPERTIES** ...introduction to the properties of Capacitors and Inductors including types and behavior in switching circuits. Inductor basics include a study of magnetic fields. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-804-196, Trigonometry w Apps.)

**10-660-108 AC 2: REACTANCE** ...study of the way inductive, capacitive and resistive components behave in a circuit excited by a sine waveform. Effective and average values of the sinewave are derived. (Corequisite: 10-660-107, AC 1: Properties)

### 10-660-110 ELECTRONICS 1: DIODES-BASIC

...introduction to the characteristics and usage of semiconductor diodes in rectifiers and linear power supplies. Special diodes and diode circuits are also considered. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-660-107, AC 1: Properties)

### 10-660-111 ELECTRONICS 2: TRANSISTOR-BASIC

...introduction to the characteristics, bias and usage of semiconductor transistors in amplifying circuitry. BJTs, JFETs, MOSFETs and general amplifier characteristics are studied. (Prerequisite: 10-660-110, Electronics 1: Diodes-Basic)

**10-664-100 AUTOMATION 1: CONTROL LOGIC** ...electric motor control components such as switches, relays, starters, transformers, and safely mount and install motor and motor control components and perform related wiring and troubleshooting of motor control circuits.

**10-664-101 AUTOMATION 2: MOTOR CONTROL** ...electric motor control components such as sensors, timers and counters. (Corequisite: 10-664-100, Automation 1: Control Logic)

**10-664-102 AUTOMATION 3: PLC** ...basic programmable logic controller programming and troubleshooting.

**10-664-103 AUTOMATION 4: PLC** ...troubleshooting a PLC System, applying Event Sequencing, developing PLC applications, applying timer instructions and counter instructions. (Corequisite: 10-664-102, Automation 3: PLC)

**10-664-104 AUTOMATION 5: PLC** ...application, troubleshooting, and implementation of program control, math and data move instructions, analog I/O modules, and producing a PLC program from specification. (Corequisite: 10-664-103, Automation 4: PLC)

**10-664-105 AUTOMATION 6: PLC** ...programming a PLC system to operate a discrete and analog process adhering to a functional specification or timing diagram. (Prerequisite: 10-664-104, Automation 5: PLC)

**10-664-109 AUTOMATION CAD 1** ...computer aided drawing packages specifically focused on the development and modification of electrical schematics utilized for controls of manufacturing equipment.

**10-664-110 AUTOMATION CAD 2** ...in-depth investigation of more advanced functions and capabilities of CAD electrical drawing package.

**10-664-150 AUTOMATION 7: PLC** ...timers, counters, and math instruction applications, creation of a function block program structure via written specification, and modification of existing PLC program to enhance operation utilizing advanced programming functions. (Prerequisite: 10-664-104, Automation 5: PLC)

**10-664-151 AUTOMATION 8: HMI** ...the functions of Human Machine Interface, Operator Interface Terminal software and generation of PLC program and screens adhering to written specification using Operator Interface Terminal and PLC software. (Prerequisite: 10-664-105, Automation 6: PLC)

**10-664-152 AUTOMATION 9: HMI** ...advanced functions of Operator Interface Terminals, differentiation between Human Machine Interface and Operator Interface Terminal, basic setup, generation of PLC program, tags, and screen objects for Human Machine Interface system. (Corequisite: 10-664-151, Automation 8: HMI)

**10-664-153 AUTOMATION 10: NETWORK** ...industrial networks used in today's manufacturing environment and their foundation, proper system hardware of an industrial network installation, and use of an industrial network to communicate data via Industrial Ethernet. (Corequisite: 10-664-152, Automation 9: HMI)

### 10-664-160 CONTROL 1: DISCRETE SYSTEMS

...applications and utilization of motion feedback devices, force measurement devices, temperature sensors, and fluid measurement devices. (Prerequisite: 10-660-110, Electronics 1: Diodes Basic)

**10-664-161 CONTROL 2: PROCESS SYSTEMS** ...Open-Loop versus Closed-Loop systems, industrial control systems, two-position control and its applications, PID control and its applications, and relationship between process response and proper mode of control. (Corequisite: 10-664-160, Control 1: Discrete Systems)

**10-664-162 CONTROL 3: MOTION SYSTEMS** ...hydraulic and pneumatic proportional/servo valves, servo motors, configuration and programming of an analog motion control system. (Corequisite: 10-664-161, Control 2: Process Systems)

**10-664-163 CONTROL 4: DRIVE PERFORMANCE** ...DC and AC Drive System performance, specification of AC and DC Drive control methods for given application, and integration of a drive system into a control network. (Prerequisite: 10-664-161, Control 2: Fundamentals)

### 10-664-165 CONTROL 6: SERVO SYSTEMS

...development and verification of motion control components and programming given description of operation, and leading technologies for advanced motion control. (Corequisite: 10-664-164, Control 5: Servo Systems)

### 10-664-189 AUTOMATION SYSTEMS INTEGRATION

...coordination and application of Automation technologies into an integrated and automated manufacturing system. (Prerequisites: Completion of 3rd semester coursework; 10-620-101, Fluids 2: Basic Hydraulics)



# Automotive Technician

Program Code 324042

## Technical Diploma

Offered at the Green Bay and Marinette campuses. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361.

For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Automotive Technician prepares students for work in an automotive service department. Students learn to repair and service all mechanical parts of the automobile under conditions similar to those in an actual repair facility.

### Program Outcomes

Automotive Technician graduates will demonstrate technical aptitude and proficiency by diagnosis and repair of the following ASE service areas:

- A1 Engine Repair.
- A2 Automatic Transmission/Transaxle
- A3 Manual Drive Train & Axle
- A4 Suspension & Steering
- A5 Brakes
- A6 Electric/Electronic Systems
- A7 Heating & A/C
- A8 Engine Performance

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and technology education.
- Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### Accreditation

- All NWTC Automotive programs are ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards.
- All instructional staff in the NWTC Automotive Programs are, at a minimum, Master, ASE Certified Technicians.
- NATEF (National Automotive Technicians Education Foundation)

We support:



### Employment Potential

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

**Automotive Service Technician:** Diagnoses vehicle malfunctions, performs appropriate repairs, and recommends/conducts regular vehicle maintenance.

**Automotive Electronics Specialist:** Utilizes high-tech equipment to troubleshoot complex electrical and computer malfunctions. Replaces and reprograms engine, body and transmission controllers.

**Brake Specialist:** Performs complete brake system safety inspections, diagnoses brake system concerns and makes necessary repairs.

**Steering, Suspension & Alignment Specialist:** Diagnoses and repairs steering and suspension system concerns, utilizes computerized equipment to perform suspension and steering system adjustments.

**Transmission and Drive Train Specialist:** Diagnoses and repairs concerns related to automatic and manual transmissions, drive trains and differentials.

**Engine Performance Specialist:** Utilizes high-tech equipment to diagnose and repair engine drivability concerns relating to engine mechanical, ignition and fuel systems.

**Heating & Air Conditioning Specialist:** Diagnoses and repairs heating and air conditioning control systems.

**Engine Repair Specialist:** Diagnoses engine mechanical failure, disassembles, inspects, and measures engine components, recommends/ conducts component replacement.

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

- Shop Supervisor
- Specialty Technician
- Fleet Dispatcher
- Specialty Repair Shop Owner
- Automotive Instructor

### Curriculum

The Automotive Technician Technical Diploma is a two-year, four-semester program. Upon graduation, a student will have completed 65 credits.

#### First Semester

Catalog No.	Description	Credits
10-602-114	Brake Technology	5
10-602-115	Engine Performance I Tech	5
10-602-117	Wiring/Schematics Tech	1
10-602-118	DC Electricity Technology	1
10-602-160	Auto Preparation Technology	1
31-442-350	Welding-Machine Trades	2
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-602-124	Steering/Suspension Tech	5
10-602-126	Chassis Electricity Tech	2
10-602-128	Auto Engine Performance II	5
10-602-161	Auto Fuels Technology I	1
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-602-135	Heating/Cooling AC Tech	4
10-602-145	Engine Repair Technology	5
10-602-147	Electronics Mfg Specifics	3
10-602-162	Auto Fuels Tech II	1
31-419-311	Hydraulics-Applied	2
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-602-129	Automotive Emission Systems	1
10-602-139	Auto Trans/Transaxle Tech 1	3
10-602-140	Auto Trans/Transaxle Tech 2	3
10-602-146	Manual Transmission/Differ	4
10-602-148	Automotive Computer Technology	2
10-602-159	Auto Body Service Technology	1
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>65</b>

This program is fully eligible for financial aid.



## 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](http://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.*

**10-602-114 BRAKE TECHNOLOGY** ...brake safety, wheel bearings, brake preventive maintenance, disc and drum brake overhaul, rotor and drum machining, master cylinder, brake lines and hoses, safety switches and valves, power and anti-lock brakes. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-115 ENGINE PERFORMANCE I TECHNOLOGY** ...engine safety, preventive maintenance, four stroke theory, ignition systems, test equipment, scopes. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Electricity Technology)

**10-602-117 WIRING/SCHEMATICS TECHNOLOGY** ...electrical symbols, wiring diagrams, tracing wiring circuits, and diagnosing electrical problems with wiring diagrams. (Corequisite: 10-602-118, DC Electricity Tech)

**10-602-118 DC ELECTRICITY TECHNOLOGY** ...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism.

**10-602-124 STEERING/SUSPENSION TECHNOLOGY** ...steering and suspension safety, tire types and ratings, wheel bearings, balance and alignment, wheel and tire runout, shocks, suspension components, steering components, steering gears. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-126 CHASSIS ELECTRICITY TECHNOLOGY** ...batteries, starting and charging system components, lighting systems components, indicator system components, horn system components, motor driven system components. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech; Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-128 AUTOMOTIVE ENGINE PERFORMANCE II** ...engine fuel safety, fuel type ratings, fuel supply components, fuel injection systems, exhaust systems, forced induction and intake, computer input/output information and scanners. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-117, Wiring/Schematics Tech; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-115, Auto Engine Performance 1 Tech)

### 10-602-129 AUTOMOTIVE EMISSION SYSTEMS

...vehicle emission control system theory, theory of component operation, diagnostics and typical service procedures. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-117, Wiring/Schematic Tech; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-115, Engine Performance 1 Tech; 10-602-128, Auto Engine Performance II)

### 10-602-135 HEATING/COOLING AC TECHNOLOGY

...related system safety, engine coolant flushing/recycling, heating system components, refrigerants, A/C systems, A/C test equipment, A/C evacuation recycling and recharging. (Corequisite: 10-602-160, Auto Preparation Technology; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematics Technology)

### 10-602-139 AUTO TRANS/TRANSAXLE TECHNOLOGY 1

...transmission/transaxle safety, transmission fluid, transmission maintenance, test procedures and external transmission adjustments. (Prerequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Elec Tech; 10-602-117, Wiring Schematics Tech; Corequisite: 10-602-140, Auto Trans/Transaxle Tech 2)

### 10-602-140 AUTO TRANS/TRANSAXLE TECHNOLOGY 2

...test procedures, transmission removal and installation, overhaul, electronic controls, input sensors, output sensors, and scanner diagnostics. (Prerequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Elec Tech; 10-602-117, Wiring Schematics Tech; Corequisite: 10-602-139, Auto Transaxle Tech)

**10-602-145 ENGINE REPAIR TECHNOLOGY** ...engine lubrication system, four stroke theory, valve timing, engine failures, valve service, cylinder head replacement, engine replacement, engine repair. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-146 MANUAL TRANSMISSION/DIFFERENTIAL TECHNOLOGY** ...drivetrain safety, universal joints, half-shafts, transmission repair/overhaul, clutch, shift linkage, four-wheel drive, differential. (Corequisite: 10-602-160, Auto Preparation Technology)

### 10-602-147 ELECTRONICS MANUFACTURERS SPECIFICS

...GM-(CCC), electronic and port fuel injection; Ford-electronic engine control IV, single and multipoint fuel injection; Bosch fuel injection systems. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech; 10-602-126, Chassis Electricity Tech; 10-602-160, Auto Preparation Technology)

### 10-602-148 AUTOMOTIVE COMPUTER TECHNOLOGY

...air bag systems, electronic control components, electronic cruise control, electronic instrument clusters/theft security, electronic transmission, electronic anti-lock breaks and electronic air conditioning.

### 10-602-159 AUTOMOTIVE BODY SERVICE TECHNOLOGY

...internal door components, body opening adjustments, exterior body components, seat removal/repair, and interior trim. (Prerequisite: 10-602-160, Auto Preparation Technology)

### 10-602-160 AUTO PREPARATION TECHNOLOGY

...personal safety, auto equipment safety, repair order information, industry computer applications, repair tools, fasteners, chemicals, vehicle preventive maintenance.

### 10-602-161 AUTOMOTIVE FUELS TECHNOLOGY I

...Compressed Natural Gas (CNG) Systems, Automotive Hybrid Vehicles, Automotive Hybrid Safety and Emergency Response and Fuel Cells.

### 10-602-162 AUTOMOTIVE FUELS TECHNOLOGY II

...automotive fuels, fuel system, components, fuel and fuel system testing, diesel engine operation.

### 31-442-350 WELDING-MACHINE TRADES

...oxyacetylene welding, brazing, soldering; cutting, hardsurfacing, out-of-position welding, arc welding of machines/accessories, running beads, types of joints, welding thin gauge, arc cutting, and heating.

# Automotive Technology

Program Code 106023

## Associate Degree

Offered at the Green Bay and Marinette campuses. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361.

For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Automotive Technology prepares students for work in an automotive repair facility. Students learn to diagnose and service automobiles under conditions similar to an actual repair facility. Students will develop repair facility management skills such as telephone etiquette, communication techniques, operation, managing, and organization skills.

### Program Outcomes

Automotive Technology graduates will demonstrate technical aptitude and proficiency by diagnosis and repair of the following ASE service areas:

- A1 Engine Repair
- A2 Automatic Transmission/Transaxle
- A3 Manual Drive Train & Axle
- A4 Suspension & Steering
- A5 Brakes
- A6 Electric/Electronic Systems
- A7 Heating & A/C
- A8 Engine Performance

In addition, graduates will also be able to:

- Communicate positively and effectively with customers
- Create and complete customer repair orders accurately
- Organize daily work schedules for themselves and for team members
- Tabulate daily time sheets of technicians' repair work

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and technology education.
- Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### Accreditation

- All NWTC Automotive programs are ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards.
- All instructional staff in the NWTC Automotive Programs are, at a minimum, Master, ASE Certified Technicians.
- NATEF (National Automotive Technicians Education Foundation)



We support:

### Employment Potential

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

**Automotive Service Technician:** Diagnoses vehicle malfunctions, performs appropriate repairs, and recommends/conducts regular vehicle maintenance.

**Automotive Electronics Specialist:** Utilizes high-tech equipment to troubleshoot complex electrical and computer malfunctions. Replaces and reprograms engine, body and transmission controllers.

**Brake Specialist:** Performs complete brake system safety inspections, diagnoses brake system concerns and makes necessary repairs.

**Steering, Suspension & Alignment Specialist:** Diagnoses and repairs steering and suspension system concerns, utilizes computerized equipment to perform suspension and steering system adjustments.

**Transmission and Drive Train Specialist:** Diagnoses and repairs concerns related to automatic and manual transmissions, drive trains and differentials.

**Engine Performance Specialist:** Utilizes high-tech equipment to diagnose and repair engine drivability concerns relating to engine mechanical, ignition and fuel systems.

**Heating & Air Conditioning Specialist:** Diagnoses and repairs heating and air conditioning control systems.

**Engine Repair Specialist:** Diagnoses engine mechanical failure. Disassembles, inspects, and measures engine components. Recommends/conducts component replacement.

**Shop Foreman:** Works with the technician and customer to get vehicles repaired correctly.

**Parts Manager:** Organizes and oversees the parts department. Works with the technicians to get the correct parts to repair the vehicles.

**Warranty Claims Person:** Calculates the amount of time spent repairing a vehicle compared to what the manufacturer will allow.

**Owner/Operator:** Owns and operates his/her own repair facility, may have employees working for him/her.

### Curriculum

The Automotive Technology Associate Degree is a two-year, four-semester program offered on both the Green Bay and Marinette Campuses. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-602-114	Brake Technology	5
10-602-115	Engine Performance I Tech	5
10-602-117	Wiring/Schematics Tech	1
10-602-118	DC Electricity Technology	1
10-602-160	Auto Preparation Technology	1
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-602-124	Steering/Suspension Tech	5
10-602-126	Chassis Electricity Tech	2
10-602-128	Auto Engine Performance II	5
10-801-195	Written Communication	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-602-135	Heating/Cooling AC Tech	4
10-602-145	Engine Repair Technology	5
10-801-196	Oral/Interpersonal Comm	3
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-602-129	Automotive Emission Systems	1
10-602-139	Auto Trans/Transaxle Tech 1	3
10-602-140	Auto Trans/Transaxle Tech 2	3
10-602-146	Manual Transmission/Differ	4
10-602-148	Automotive Computer Technology	2
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

### 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](http://www.nwtc.edu) or consult a counselor, (920) 498-5444.
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### Course Descriptions

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

**10-602-114 BRAKE TECHNOLOGY** ...brake safety, wheel bearings, brake preventive maintenance, disc and drum brake overhaul, rotor and drum machining, master cylinder, brake lines and hoses, safety switches and valves, power and anti-lock brakes. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-115 ENGINE PERFORMANCE I TECHNOLOGY** ...engine safety, preventive maintenance, four stroke theory, ignition systems, test equipment, scopes. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Electricity Technology)

**10-602-117 WIRING/SCHEMATICS TECHNOLOGY** ...electrical symbols, wiring diagrams, tracing wiring circuits, and diagnosing electrical problems with wiring diagrams. (Corequisite: 10-602-118, DC Electricity Tech)

**10-602-118 DC ELECTRICITY TECHNOLOGY** ...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism.

**10-602-124 STEERING/SUSPENSION TECHNOLOGY** ...steering and suspension safety, tire types and ratings, wheel bearings, balance and alignment, wheel and tire runout, shocks, suspension components, steering components, steering gears. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-126 CHASSIS ELECTRICITY TECHNOLOGY** ...batteries, starting and charging system components, lighting systems components, indicator system components, horn system components, motor driven system components. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech; Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-128 AUTOMOTIVE ENGINE PERFORMANCE II** ...engine fuel safety, fuel type ratings, fuel supply components, fuel injection systems, exhaust systems, forced induction and intake, computer input/output information and scanners. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-117, Wiring/Schematics Tech; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-115, Auto Engine Performance 1 Tech)

#### 10-602-129 AUTOMOTIVE EMISSION SYSTEMS

...vehicle emission control system theory, theory of component operation, diagnostics and typical service procedures. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-117, Wiring/Schematic Tech; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-115, Engine Performance 1 Tech; 10-602-128, Auto Engine Performance II)

#### 10-602-135 HEATING/COOLING AC TECHNOLOGY

...related system safety, engine coolant flushing/recycling, heating system components, refrigerants, A/C systems, A/C test equipment, A/C evacuation recycling and recharging. (Corequisite: 10-602-160, Auto Preparation Technology; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematics Technology)

#### 10-602-139 AUTO TRANS/TRANSAXLE TECHNOLOGY 1

...transmission/transaxle safety, transmission fluid, transmission maintenance, test procedures and external transmission adjustments. (Prerequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Elec Tech; 10-602-117, Wiring Schematics Tech; Corequisite: 10-602-140, Auto Trans/Transaxle Tech 2)

#### 10-602-140 AUTO TRANS/TRANSAXLE TECHNOLOGY 2

...test procedures, transmission removal and installation, overhaul, electronic controls, input sensors, output sensors, and scanner diagnostics. (Prerequisites: 10-602-160, Auto Preparation Technology; 10-602-118, DC Elec Tech; 10-602-117, Wiring Schematics Tech; Corequisite: 10-602-139, Auto Transaxle Tech)

**10-602-145 ENGINE REPAIR TECHNOLOGY** ...engine lubrication system, four stroke theory, valve timing, engine failures, valve service, cylinder head replacement, engine replacement, engine repair. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-146 MANUAL TRANSMISSION/DIFFERENTIAL TECHNOLOGY** ...drivetrain safety, universal joints, half-shafts, transmission repair/overhaul, clutch, shift linkage, four-wheel drive, differential. (Corequisite: 10-602-160, Auto Preparation Technology)

**10-602-148 AUTOMOTIVE COMPUTER TECHNOLOGY** ...air bag systems, electronic control components, electronic cruise control, electronic instrument clusters/theft security, electronic transmission, electronic anti-lock breaks and electronic air conditioning.

**10-602-160 AUTO PREPARATION TECHNOLOGY** ...personal safety, auto equipment safety, repair order information, industry computer applications, repair tools, fasteners, chemicals, vehicle preventive maintenance.





# Business Management

Program Code 101023

## Associate Degree

Offered at the Green Bay campus. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Business Management program prepares students for a career as a management trainee, operations assistant, or to successfully manage their own business. The training provides learners with a broad background in business management and prepares the graduate to make sound business decisions with specific skills in finance and business decision making, marketing, supply chain management, human resource management and office management in a broad spectrum of industries.

General business managers are found in nearly all work settings in virtually every sector of the economy. Business management salaries vary by company and position. Most graduates begin in positions of limited responsibility and will advance through the ranks of the organization.

The purpose of the program is to develop business professionals who can grow with the needs of their employers. The program increases opportunities for those seeking a job change or advancement or those pursuing self-employment. Program curriculum will develop or improve the core skills that are vital for success in the business world.

### Program Outcomes

- Demonstrate professionalism in management of time, stress, and change.
- Demonstrate basic accounting and financial skills.
- Apply marketing strategies to an enterprise.
- Exhibit leadership skills.
- Apply global supply chain business perspective.
- Exhibit professional communication and customer satisfaction strategies.
- Recognize foundations of human behavior and social integration.
- Utilize performance management techniques.
- Solve problems independently and in a team environment.
- Apply concepts, methods, processes and functions of management to business operations.
- Value diversity.
- Apply current and emerging technologies to business situations.
- Analyze and synthesize information and make decisions that support the organization's mission and help the business to successfully adapt to a changing environment.

### Requirements For Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).

### Employment Potential

There are many job listings that would be appropriate for a graduate of the Business Management program. Small organizations typically require generalist skills and large organizations tend toward some specialization among their managers. Business managers often work under the supervision of senior leadership.

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

- Management Trainee or Operations Assistant
- Advertising and Promotions
- Sales
- Administrative Services
- Purchasing
- Finance
- Human Relations
- Food Services
- Lodging
- Medical and Health Care
- Agriculture
- Self Employment

**With additional education and/or work experience, a graduate may find employment opportunities as a manager with increased responsibility, authority and commensurate pay.**

### Note

- Many courses in this program are delivered in a variety of formats such as accelerated, online, in person or video conference.
- Learners are able to concurrently pursue an associate degree from Northeast Wisconsin Technical College and a bachelor's degree from Lakeland College in Business Management. Please contact an NWTC counselor or academic advisor for more information.

This program is fully eligible for financial aid.

### Curriculum

The Business Management Program is a two-year, four-semester program. Upon graduation, a student will have completed 66 credits.

#### ALL STUDENTS MUST COMPLETE

10-102-158	Business-Intro	3
10-104-110	Marketing Principles	3
* 10-103-121	Micro: Word-Intro	1
* 10-103-131	Micro: Excel-Intro	1
* 10-103-141	Micro: Access-Intro	1
* 10-103-151	Micro: PowerPoint-Intro	1
* 10-111-103	Graphic Workstations	1
* 10-101-190	Accounting-QuickBooks	1
10-104-191	Customer Service Mgmt	3
10-101-106	Accounting-for Non-Accountants	3
10-102-150	Law-Business	3
10-196-193	Human Resource Mgmt	3
10-102-160	Global Business Mgmt	3
10-196-136	Safety-Workplace	3
<b>Total</b>		<b>27</b>

\* Select any three of the six courses

#### GEN ED CORE

10-801-136	English Composition 1	3
10-801-198	Speech	3
10-804-123	Math w Business Apps	3
10-809-172	Race Ethnic & Diversity	3
10-809-198	Intro to Psychology	3
10-809-195	Economics	3
10-809-103	Think Critically & Creatively	3
<b>Total</b>		<b>21</b>

#### Select ONE of the Following Concentrations:

##### BUSINESS MANAGEMENT

10-196-164	Supervisors-Personal Skills	3
10-104-101	Selling Principles	3
10-182-157	Logistics/Supply Chain Mgmt	3
10-182-110	Lean Operations Mgmt	3
10-196-145	Workplace Innovation	3
10-102-188	Business Management Internship	3

OR

10-102-190	Business Mgmt Field Study	3
<b>Credits for Business Management</b>		<b>18</b>

##### ENTREPRENEURSHIP

10-145-188	Entrepreneurship Management	3
10-145-186	Financial Man Small Business	3
10-145-187	Marketing Small Business	3
10-145-185	Organizing Small Business	3
10-145-189	Writing Bus Plan Small Business	3
<b>Elective</b>		<b>3</b>

<b>Credits for Entrepreneurship</b>		<b>18</b>
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##### RETAIL MANAGEMENT

10-104-135	Retail Management-Survival	3
10-104-101	Selling Principles	3
10-104-190	Retail Principles	3
10-104-192	Merchandise Management	3
10-104-193	Retail Operations	3
10-104-164	Retail Management Internship	3

OR

10-104-180	Retail Management Field Study	3
<b>Credits for Retail Management</b>		<b>18</b>

##### HOTEL & RESTAURANT MANAGEMENT

10-109-114	Front Office Management	3
10-109-126	Food/Lodging Cost Control	3
10-109-127	Housekeeping/Facilities Mgmt	3
10-104-125	Event Marketing	3
10-109-168	Beverage/Dining Room Mgmt	3
10-109-165	Hotel/ Restaurant Mgmt Retail-Internship	3

OR

10-109-181	Hotel Restaurant Mgmt Retail Field Study	3
<b>Credits for Hotel &amp; Restaurant Management</b>		<b>18</b>

<b>Total Credits</b>		<b>66</b>
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## 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](http://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.*

### 10-101-106 ACCOUNTING: INTRO FOR NON-

**ACCOUNTANTS** ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

### 10-101-190 ACCOUNTING-QUICKBOOKS

...an introductory course in using QuickBooks to create vendor/employee accounts, invoices, budgets, profit/loss statements, balance sheets, A/R, A/P, journals, graphs.

**10-102-150 LAW-BUSINESS** ...common law contracts and sales contracts: formation, interpretation, performance, and discharge; the law of agency; corporations; and introduction to the American legal system: criminal and tort law, and global business issues.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

### 10-102-160 GLOBAL BUSINESS MANAGEMENT

...globalization, cultural environment, global trade environment, politics and law, economic integration, global trade and investment theories, exporting, global marketing, and global supply chain.

### 10-102-188 BUSINESS MANAGEMENT INTERNSHIP

...training in an appropriate setting through actual work experience and observation.

### 10-102-190 BUSINESS MANAGEMENT FIELD STUDY

...alternative to the internship: in-depth study of an industry, business, career, or project.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-104-101 SELLING PRINCIPLES** ...selling as a career; success factors in selling; personality development; product knowledge; and the sales process involving preparation, approach, presentation-demonstration, handling objections, and closing the sale successfully.

**10-104-110 MARKETING PRINCIPLES** ...marketing management, market segmentation, market research, consumer behavior, product decisions and management of distribution, pricing, promotional decisions for strategy planning.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-111-103 GRAPHIC WORKSTATIONS** ...explore the Macintosh Operating System and applications including iPhoto, iTunes, iMovie, GarageBand, FontBook, Sherlock, iCal, AddressBook and Dashboard. Learn to navigate the Mac Operating System and manage files and folders.

**10-182-110 LEAN OPERATIONS MANAGEMENT** ...lean operating concepts, total quality management, six sigma methodologies, continuous improvement tools/techniques, process mapping, 5S principles, statistical process control/pull signals, cellular manufacturing, mixed-model production, human resource development.

**10-182-157 LOGISTICS/SUPPLY CHAIN MANAGEMENT** ...integrated logistics supply chain, dimensions of logistics and supply chain management, demand management and customer service, procurement and supply management, global logistics, inventory management, warehousing, transportation and third-party logistics.

**10-196-136 SAFETY-WORKPLACE** ...safety awareness, federal/state/local compliance, inspections, risk analysis, workplace violence, substance abuse, health hazards, first aid, CPR, fire and electrical safety, and emergency preparedness.

**10-196-145 WORKPLACE INNOVATION** ...use of inventive thinking techniques and innovative methods to improve work processes in multiple workplace environments; research and analyze the use of technology in businesses to promote innovation in the workplace; and develop an innovative, entrepreneurial, and intrapreneurial mindset.

**10-196-164 SUPERVISORS-PERSONAL SKILLS** ...time management and personal planning, emotional intelligence, effective communication, assertiveness and stress management related to the challenges of a supervisor.

**10-196-193 HUMAN RESOURCE MANAGEMENT** ...impacts of EEOC, writing job descriptions, recruitment, selection, conducting job interviews, orientation, developing policies and procedures, training, performance, counseling and development, and compensation and benefit strategies.

# Casino Management

Program Code 101097

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Casino Management program prepares students to operate and manage the dynamics of the gaming industry including direct customer interaction, regulatory compliance, and security/surveillance/maintenance aspects of both electronic and table games. Specific applications of the ethical, psychological and socio-cultural impacts associated with gaming as a form of recreation and entertainment will be analyzed.

### Program Outcomes

- Communicate effectively in written and verbal forms.
- Value diversity in the workplace.
- Perform mathematical calculations for business applications.
- Apply management processes and techniques to the gaming industry, including: planning, organizing, staffing, budgeting, controlling and evaluation.
- Integrate responsibility, accountability, and authority in human resource issues.
- Analyze current business practices/issues and their application to gaming industry.
- Demonstrate positive workplace attributes for personal/career success.
- Understand the historical base and contemporary issues in tribal/gaming laws.
- Ensure gaming regulations are adhered to, followed, and reported.
- Apply legal and ethical principles to personal and professional behaviors.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Good writing and communication skills.
- Strong organizational skills.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Note

Several of the Casino Management classes are offered online. Please call (920) 498-5573 for more information.

### Employment Potential

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

**Casino Operations Specialist:** Responsible for providing leadership and overseeing daily operations in a casino gaming operation environment.

**Gaming Security Officer:** Ensure a safe and enjoyable environment on the floor for customers and employees; perform day to day operations of gaming protection duties, responsibilities and tasks.

#### Mid-Level Gaming Operation Management:

Supervision of officers and/or operators; schedule day to day assigned duties; ensure gaming regulations are adhered to, followed and reported.

**Gaming Surveillance Operator:** Observe and report breaches of security and gaming operations to proper personnel.

**With additional education and/or work experience, graduates may find other leadership opportunities within gaming employment.**

### Certificates

Students who complete courses in the Casino Management Associate Degree are also eligible for certificates. Each semester qualifies students to receive a certificate:

- **First Semester:**  
Foundations of Gaming Leadership
- **Second Semester:**  
Gaming Customer Relationships Management
- **Third Semester:**  
Gaming Operations Certificate
- **Fourth Semester:**  
With the addition of two courses (10-504-131) Professional Communications and (10-504-118) Protective Services-Technical Reporting, students receive the Gaming Security and Surveillance Certificate.

### Curriculum

The Casino Management program prepares students to operate and manage the dynamics of the gaming industry including direct customer interaction, regulatory compliance, and security/surveillance/maintenance aspects of both electronic and table games. Specific applications of the ethical, psychological and socio-cultural impacts associated with gaming as a form of recreation and entertainment will be analyzed.

#### First Semester

Catalog No.	Description	Credits
10-109-185	Gaming Regulations	3
10-109-187	Intro to Casino Operations	3
10-196-164	Supervisors-Personal Skills	3
10-196-189	Team Building/Prob Solve	3
10-196-191	Supervision	3
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-102-158	Business-Intro	3
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-141	Micro: Access-Intro	1
10-104-191	Customer Service Mgmt	3
10-109-186	Casino Marketing	3
10-801-196	Oral/Interpersonal Comm	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-109-188	Slots Management	3
10-109-198	Table Games Management	3
10-196-193	Human Resource Mgmt	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>

#### Fourth Semester

10-504-124	Gaming Protection	3
10-504-125	Surveillance Operations	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-199	Psychology Of Human Relations	3
	Elective	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>66</b>

#### Suggested Electives:

10-109-192, Casino Operations-Internship  
OR  
10-109-193, Casino Operations-Field Study  
10-504-131, Professional Communication  
10-504-142, Constitutional Law  
10-504-118, Protective Services-Technical Reporting

This program is fully eligible for financial aid.

## 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](http://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.*

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-109-185 GAMING REGULATIONS** ...provides an in-depth look at regulatory systems used in gaming; information on regulatory framework, Indian Gaming regulations, and Federal Governments involvement in this relationship.

**10-109-186 CASINO MARKETING** ...an in-depth study of gaming marketing techniques used in gaming both locally and nationwide. Emphasis on casino marketing department, staffing, organization, duties and procedures.

**10-109-187 INTRODUCTION TO CASINO OPERATIONS** ...management techniques used in gaming. Emphasis on casino organization, staffing, labor/management relations both for the mid-level casino supervisor and the casino executive.

**10-109-188 SLOTS MANAGEMENT** ...emphasis on casino organization, staffing and labor/management relations both for the mid-level casino supervisor and the casino executive. Practical application of technicians, floor, shift managers duties is stressed.

**10-109-198 TABLE GAMES MANAGEMENT** ...basic understanding of rules and regulations for roulette, slots, blackjack and Caribbean stud games and understanding the various personnel roles, duties and their functions.

**10-196-164 SUPERVISORS-PERSONAL SKILLS** ...time management and personal planning, emotional intelligence, effective communication, assertiveness and stress management related to the challenges of a supervisor.

**10-196-189 TEAM BUILDING/PROBLEM SOLVING** ...benefits and challenges of group work, necessary roles in a team, stages of team development, meeting facilitation, different approaches to problem solving, consensus, data acquisition, analysis, developing alternative solutions, implementation and evaluation.

**10-196-191 SUPERVISION** ...front-line leadership including teamwork, setting goals, planning, delegation, controlling, communication, motivation, performance management, staffing, training, problem solving, and conflict management.

**10-196-193 HUMAN RESOURCE MANAGEMENT** ...impacts of EEOC, writing job descriptions, recruitment, selection, conducting job interviews, orientation, developing policies and procedures, training, performance, counseling and development, and compensation and benefit strategies.

**10-504-124 GAMING PROTECTION** ...basic gaming sheets, slots and table games, observe suspicious activity and breaches of policy procedure.

**10-504-125 SURVEILLANCE OPERATIONS** ....basic understanding of camera systems and operations, policy and procedures for the various geographical areas of the casino and observation techniques.



# Civil Engineering Technology

Program Code 106071

## Associate Degree

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 demonstrate 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 respect for race, ethnic and diversity issues.
- Students will have a commitment to quality, timeliness and continuous improvement.

### Accreditation

The Civil Engineering Technology Associate Degree program at NWTC is accredited by the Engineering Technology Accreditation Commission of ABET, <http://www.abet.org>, under the commission's General Criteria and Program Specific Criteria for Civil Engineering Technology and Similarly Named Programs.

### Board/Certification Examinations

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

### 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.

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, HSED transcript, or General Education Development® (GED) Tests 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.
- Students will be required to take the Accuplacer College Level Math assessment. The benchmark grade for Civil Engineering Technology on the College Math assessment is 63. An alternative to the College Level Math assessment would be a score of 21 on the Math portion of the ACT.

### 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
<b>Semester Total</b>		<b>17</b>

#### 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
<b>Semester Total</b>		<b>17</b>

#### Summer Semester

10-607-191	Civil Engineering Internship	1
<b>Semester Total</b>		<b>1</b>

#### 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
<b>Semester Total</b>		<b>18</b>

#### 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
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>68</b>

#### Suggested Electives:

Land Law II, 10-607-155

This program is fully eligible for financial aid.



### 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](http://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. (Corequisite: 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. (Corequisites: 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, CAD; 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: 10-606-113, CAD; 10-804-196, Trigonometry w Apps)

**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. (Prerequisites: 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.)

# Clinical Laboratory Technician

Program Code 105131

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Clinical Laboratory Technician is a member of the health care team who provides clinical information for disease prevention, medical diagnosis, and treatment of the patient by processing specimens and performing laboratory tests by manual and automated methods. Clinical Laboratory Technicians may also have responsibilities for information processing, training, and quality control monitoring.

### Program Outcomes

- Apply modern clinical methodologies including problem solving and trouble shooting according to predetermined criteria.
- Perform preventative and corrective maintenance of equipment and instruments according to predetermined criteria.
- Collect and process biological and other specimens.
- Perform and report results of clinical laboratory tests.
- Apply laboratory results to diagnosis of clinical conditions and/or diseases.
- Monitor and evaluate quality control in the laboratory.
- Practice laboratory safety and regulatory compliance.
- Communicate with colleagues and patients in a professional manner.
- Perform information processing in the clinical laboratory.
- Model professional behaviors, ethics, and appearance.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Dependent on availability of sites, students may need to travel distances for clinical experiences. Students are required to maintain a current CPR card to comply with affiliating agency requirements.

### Employment Potential

Most Clinical Laboratory Technicians work in hospitals or clinic labs. Some Clinical Laboratory Technicians may choose to work for veterinary laboratories, industrial labs, insurance companies, research facilities, environmental labs, or public health.

**Clinical Laboratory Technician:** applies knowledge of test procedures and quality control methods in the areas of hematology, chemistry, serology, urinalysis, blood bank, microbiology, and phlebotomy; performs tests accurately and efficiently using both automated and manual methodology; evaluates the clinical significance of test results.

### Accreditation

The Clinical Laboratory Technician program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) 8410 W. Bryn Mawr Ave., Suite 670 Chicago, IL 60631, (312) 714-8880

### Board/Certification Examinations

Graduates are qualified to take the Board of Registry examination from the American Society for Clinical Pathology as well as the credentialing examination of the National Certification Agency for Laboratory Personnel.

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- Two years of algebra, or one year of algebra and one year of advanced math, with a “C” or better (or attain program benchmark for algebra on the Academic Skills Assessment).
- One year of Biology and Chemistry with a grade of “C” or better. If in high school, “C” in two semesters of each.

### Priority Admission

Applicants with documentation of completion of Intro to Biochemistry, with a “B” or better, will receive priority standing amongst that year’s applicant pool.

### Requirement for Program Entry

- Meet established Academic Skills Assessment program benchmarks, or achieve a minimum standard composite score of 20 on the ACT with acceptable scores in Math, Reading, and English. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Complete physical examination and provide current immunization information three months prior to entering program.
- Submit Caregiver Background Check paperwork.
- Complete mandatory four-hour job shadow.
- Attend mandatory spring program orientation.

### Curriculum

The Clinical Laboratory Technician Associate Degree is a two-year, five-semester program. Upon completion, a student will have completed 66 credits.

#### First Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
* 10-513-110	Basic Lab Skills	1
* 10-513-111	Phlebotomy	2
* 10-513-113	QA Lab Math	1
* 10-513-115	Basic Immunology Concepts	2
* 10-806-177	Gen Anatomy & Physiology	4
* 10-806-186	Intro to Biochemistry	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

* 10-513-114	Urinalysis	2
* 10-513-120	Basic Hematology	3
* 10-513-121	Coagulation	1
* 10-513-122	Introduction to Blood Bank	2
* 10-513-123	Advanced Blood Bank	2
10-801-195	Written Communication	3
* 10-806-197	Microbiology	4
<b>Semester Total</b>		<b>17</b>

#### Summer Semester

10-801-196	Oral/Interpersonal Comm	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>6</b>

#### Third Semester

* 10-513-130	Advanced Hematology	2
* 10-513-131	Clinical Chemistry 1	3
* 10-513-132	Clinical Chemistry 2	2
* 10-513-133	Clinical Microbiology	4
* 10-513-140	Advanced Microbiology	2
<b>Semester Total</b>		<b>13</b>

#### Fourth Semester

* 10-513-151	Clinical Experience 1	3
* 10-513-152	Clinical Experience 2	4
* 10-513-153	Clinical Experience 3	4
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>14</b>
<b>Total Credits</b>		<b>66</b>

\* No final grade lower than a “C” is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a “C” in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

This program is fully eligible for financial aid.

## 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](http://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.*

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-513-110 BASIC LAB SKILLS** ...explores health career options and the fundamental principles and procedures performed in the clinical laboratory. Learners will utilize medical terminology and basic laboratory equipment. Learners will follow required safety and infection control procedures and perform simple laboratory tests. (Prerequisite: Accepted into Clinical Laboratory Technician Program or Phlebotomy Certificate)

**10-513-111 PHLEBOTOMY** ...this course provides opportunities for learners to perform routine venipuncture, routine capillary puncture and special collection procedures. (Corequisite: 10-513-110, Basic Lab Skills)

**10-513-113 QA LAB MATH** ...focuses on performing the mathematical calculations routinely used in laboratory settings. Learners will explore the concepts of quality control and quality assurance in the laboratory. Learners will review regulatory compliance requirements, and certification and continuing education programs. (Prerequisite: Accepted into the Clinical Laboratory Technician program)

**10-513-114 URINALYSIS** ...prepares learners to perform a complete urinalysis which includes physical, chemical and microscopic analysis. Learners will explore renal physiology and correlate urinalysis results with clinical conditions. (Prerequisites: 10-513-110, Basic Lab Skills and 10-513-113, QA Lab Math)

**10-513-115 BASIC IMMUNOLOGY CONCEPTS** ...provides an overview of the immune system including laboratory testing methods for diagnosis of immune system disorders, viral and bacterial infections. (Corequisite: 10-513-110, Basic Lab Skills)

**10-513-120 BASIC HEMATOLOGY** ...covers the theory and principles of blood cell production and function, and introduces the learner to basic practices and procedures in the hematology laboratory. (Prerequisites: 10-513-110, Basic Lab Skills; 10-513-113, QA Lab Math; 10-513-111, Phlebotomy; 10-513-115, Basic Immunology Concepts)

**10-513-121 COAGULATION** ...introduces the theory and principles of coagulation and explores mechanisms involved in coagulation disorders. Emphasis is placed upon laboratory techniques used to diagnose disease and monitor treatment. (Prerequisites: 10-513-110, Basic Lab Skills; 10-513-113, QA Lab Math; 10-513-115, Basic Immunology Concepts; 10-513-111, Phlebotomy; Corequisite: 10-513-120, Basic Hematology)

**10-513-122 INTRODUCTION TO BLOOD BANK** ...introduces basic blood banking concepts and procedures including blood typing and compatibility testing. (Prerequisites: 10-513-110, Basic Lab Skills; 10-513-113, QA Lab Math; 10-513-115, Basic Immunology Concepts)

**10-513-123 ADVANCED BLOOD BANK** ...focuses on advanced blood banking concepts and procedures including work ups for adverse reaction to transfusions and disease states. (Corequisite: 10-513-122, Introduction to Blood Bank)

**10-513-130 ADVANCED HEMATOLOGY** ...explores mechanisms involved in the development of hematological disorders. Emphasis is placed upon laboratory techniques used to diagnose disorders and monitor treatment. (Prerequisite: 10-513-120, Basic Hematology)

**10-513-131 CLINICAL CHEMISTRY 1** ...introduces Clinical Chemistry techniques and procedures for routine analysis using photometric, potentiometric and separation techniques. Topics in this course include pathophysiology and methodologies for carbohydrate, lipids, proteins, renal function and blood gas analysis. (Prerequisites: 10-513-110, Basic Lab Skills; 10-513-113, QA Lab Math; 10-513-114, Urinalysis; 10-806-177, General Anatomy & Physiology; 10-806-186, Intro to Biochemistry)

**10-513-132 CLINICAL CHEMISTRY 2** ...a continuation of Clinical Chemistry Diagnostics, techniques and procedures for analysis using sophisticated laboratory instrumentation. Topics include pathophysiology and methodologies for hepatic, bone, cardiac markers, tumor markers, endocrine function, fetal function, miscellaneous body fluids, and toxicology. (Corequisite: 10-513-131, Clinical Chemistry 1)

**10-513-133 CLINICAL MICROBIOLOGY** ...presents the clinical importance of infectious diseases with emphasis upon the appropriate collection, handling and identification of clinically relevant bacteria. Disease states, modes of transmission and methods of prevention and control, including antibiotic susceptibility testing, are also discussed. (Prerequisites: 10-806-197, Microbiology; 10-513-110, Basic Lab Skills)

**10-513-140 ADVANCED MICROBIOLOGY** ...overview of acid fast organisms, fungi, parasites, and anaerobic bacteria. The organisms, their pathophysiology, epidemiology, the diseases and conditions that they cause, laboratory methods of handling, culturing and identification will be discussed. (Corequisite: 10-513-133, Clinical Microbiology)

**10-513-151 CLINICAL EXPERIENCE 1** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Clinical Chemistry 2; Corequisites: 10-513-152, Clinical Experience 2; 10-513-153, Clinical Experience 3)

**10-513-152 CLINICAL EXPERIENCE 2** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Clinical Chemistry 2; Corequisites: 10-513-151, Clinical Experience 1; 10-513-153, Clinical Experience 3)

**10-513-153 CLINICAL EXPERIENCE 3** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Clinical Chemistry 2; Corequisites: 10-513-151, Clinical Experience 1; 10-513-152, Clinical Experience 2)



# Computer Support Specialist - IT

Program Code 101543

## Associate Degree

Offered at the Green Bay and Marinette campuses.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Computer Support Specialist - IT program emphasizes problem solving using current software packages, programming in Visual BASIC, hardware configurations, networking, operating systems, and software system design.

### Program Outcomes

- Develop attractive and effective slide shows using PowerPoint presentation software.
- Develop professional letters and reports using Word document processing software.
- Develop professional and user-friendly spreadsheets using Excel spreadsheet software.
- Develop business applications which integrate and share different types of files or objects.
- Automate application software operations via macros and VBA programming techniques.
- Develop relational database applications using database management software.
- Design a normalized database.
- Develop attractive and effective Web pages using HTML coding techniques.
- Develop functional Web pages that automate operations using Java Script programming techniques.
- Install, configure, and maintain computer hardware and peripherals.
- Troubleshoot and repair computer hardware and operating systems problems.
- Develop computer programs to perform common business functions using the Visual BASIC programming language.
- Perform basic computer system functions and operations using the command line and shell scripts.
- Configure and administer common microcomputer operating systems.
- Automate Windows operations using common operating system scripting languages.
- Perform common help desk and end-user support functions using current technologies and protocols.
- Plan and conduct computer training sessions using appropriate technologies and delivery methods.
- Develop effective lesson plans, training materials, and assessment tools to support technical presentations.
- Develop technical documentation and "help" resources to support the use of computer facilities and services.
- Apply job seeking skills to secure employment in the computer field.

### Employment Potential

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

**IT Consultant:** provides one-on-one problem solving for users.

**Help Desk/Support Specialist:** develops customized user menus, installs software packages, administers networks, and is a support technician for software packages.

**PC Programmer:** performs detailed program design, coding, testing, debugging, documentation, and implementation of online or interactive systems.

**Computer Sales Representative:** makes customer calls, establishes customer contacts, identifies customer needs, and prepares proposals.

**IT Trainer:** trains employees on software packages which enable the user to solve problems on an individual basis.

**Network Assistant:** helps to configure networks, installs hardware and software, and trains users.

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

- Network Administrator
- Database Administrator
- Internet Site Administrator
- Hardware Technician
- IT Department Supervisor

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- One year of high school algebra or equivalency.
- Ability to use computer keyboard and mouse.

### Note:

A student desiring a strong financial background or a student planning to double major in Accounting is advised to substitute the four credit Accounting 1 (10-101-110) for the three-credit Accounting for Non-Accountants (10-101-106). To discuss this further, please contact an NWTC counselor or advisor.

### Curriculum

The Computer Support Specialist - IT Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-101-106	Accounting-for Non-Accountants	3
10-154-150	IT:Support:Hardware-Intro	3
10-154-159	IT:Support:Scripting	3
10-154-160	IT:Support:Software-Intro	3
10-801-195	Written Communication	3
10-804-133	Math & Logic	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-102-158	Business-Intro	3
10-152-163	IT:Program:Visual Basic	3
10-154-152	IT:Support:Operating Systems	3
10-154-161	IT:Support:Database Theory	2
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-107-194	IT:Documentation	2
10-150-144	IT:Network:Operating Sys Fund	3
10-154-158	IT:Support:Hardware-Advanced	3
10-154-171	IT:Support:Integration-VBA	3
10-154-172	IT:Support:Database App	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-107-195	IT:Training	2
10-154-180	IT:Support:Web Techniques	3
10-154-190	IT:Support:Help Desk/User Sup	2
10-154-193	IT:Support:Internship	3
10-809-195	Economics	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>68</b>

### Suggested Electives:

IT:Project/Chg Mg 1-MS Project, 10-107-151  
IT:Network:UNIX/LINUX-Intro, 10-150-157  
IT:Network:Cisco 1, 10-150-163  
IT:Program:Java-Intro, 10-152-107  
IT:Program:C++, 10-152-173  
IT:Program:Visual Basic-Adv, 10-152-175

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-101-106 ACCOUNTING: INTRO FOR

**NON-ACCOUNTANTS** ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-107-194 IT:DOCUMENTATION** ...students plan documentation content and delivery methods; develop online, context sensitive, and written documentation, become familiar with ISO 9000 standards, package PDF files, and create compiled help modules. (Prerequisite: 10-801-195, Communication-Written or equivalent)

**10-107-195 IT:TRAINING** ...effective presentation skills, plan training content and delivery methods, write lesson plans, provide training materials, conduct training sessions, and assess learners' grasp of stated objectives. (Prerequisites: 10-154-160, IT:Support:Software-Intro AND 10-154-150, IT:Support:Hardware-Intro)

### 10-150-144 IT:NETWORK:OPERATING SYSTEM

**FUNDAMENTALS** ...installation of Windows client, Windows Server and Linux Server operating systems. Basic networking topologies and protocol fundamentals. Application installation including Simple Mail Transport Protocol, File Transfer Protocol, and Web server technologies.

**10-152-163 IT:PROGRAM:VISUAL BASIC** ...introduction to programming using the Visual Basic.NET programming language. Program definition and design, form design, and the coding, testing, and debugging of programs is covered. (Prerequisite: 10-154-159, IT:Support:Scripting or experience using a programming language.)

**10-154-150 IT:SUPPORT:HARDWARE-INTRO** ...computer/network terminology, component identification, POST, computer/peripheral/printer maintenance, system boards, memory systems, FAT vs. NTFS, operating system/network installations/configurations, internet research, troubleshooting, command line.

**10-154-152 IT:SUPPORT:OPERATING SYSTEMS** ...explain the role of the microcomputer operating system, implement operating system communications and networking components, perform standard operating system maintenance, and recognize current server and infrastructure device operating systems. (Prerequisite: 10-154-150, IT:Support:Hardware-Intro)

**10-154-158 IT:SUPPORT:HARDWARE-ADVANCED** ...advanced micro hardware and operating system configuration and maintenance; disk storage configuration; Windows registry, virus and component troubleshooting, diagnosis, upgrades and repair. (Prerequisites: 10-154-150, IT:Support:Hardware-Intro AND 10-154-152, IT:Support:Operating Systems)

**10-154-159 IT:SUPPORT:SCRIPTING** ...introduction to Windows scripting languages and programming techniques. Scripting methodologies will include Windows shell scripts and Windows Script Hosting using VBScript.

**10-154-160 IT:SUPPORT:SOFTWARE-INTRO** ...an introductory course for the Computer Support Specialist program and covers the fundamental capabilities and functions of Word, PowerPoint, Excel, Email correspondence, Internet search engines, and file compression.

### 10-154-161 IT:SUPPORT:DATABASE THEORY

...fundamentals of database design and administration, including normalization, design methodology, SQL, integrity rules, database management functions and approaches.

**10-154-171 IT:SUPPORT:INTEGRATION-VBA** ...using Visual Basic for Applications (VBA) to automate operations primarily within the Microsoft Excel object model; integration of other Microsoft Office applications/objects; fundamental programming constructs and data manipulations. (Prerequisites: 10-154-160, IT:Support:Software-Intro AND 10-154-159, IT:Support:Scripting)

### 10-154-172 IT:SUPPORT:DATABASE APPLICATION

...database management and application development including design, automation, and use of relational database management systems. (Prerequisite: 10-154-161, IT:Support:Database Theory)

**10-154-180 IT:SUPPORT:WEB TECHNIQUES** ...web design using HTML and JavaScript. (Prerequisite: 10-152-163, IT:Program:Visual Basic AND 10-154-159, IT:Support:Scripting)

### 10-154-190 IT:SUPPORT:HELP DESK/END USER SUPPORT

...describe the role of the help desk in technology support, use terminology, processes, and tools, and demonstrate the use of business, technical, communication, and self-management skills required for help desk support professionals.

**10-154-193 IT:SUPPORT:INTERNSHIP** ...job-seeking skills; individual on-the-job training; consulting with users in design, development, testing, debugging, and documentation problems; training in uses of software packages; configuring and installing hardware and networks. Course should be taken during the final semester.

# Computer Support Technician - IT

Program Code 311546

## Technical Diploma

Offered at the Marinette campus.

For information: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Computer Support Technician - IT emphasizes problem solving using microcomputer hardware and software facilities including command line environment and Windows operating systems, Microsoft Word, and Microsoft Excel.

### Program Outcomes

- Develop attractive and effective slide shows using PowerPoint presentation software.
- Develop professional letters and reports using Word document processing software.
- Develop professional and user-friendly spreadsheets using Excel spreadsheet software.
- Develop business applications, which integrate and share different types of files or objects.
- Automate application software operations via macros.
- Install, configure, and maintain computer hardware and peripherals.
- Perform basic computer system functions and operations using the command line and shell scripts.
- Configure and administer common microcomputer operating systems.
- Automate Windows operations using common operating system scripting languages.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- One year of high school algebra or equivalent.
- Ability to use computer keyboard and mouse.

### Employment Potential

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

**IT Consultant:** provides one-on-one problem solving for users.

**Computer Sales Representative:** makes customer calls, establishes customer contacts, identifies customer needs, and prepares proposals.

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

- IT Trainer
- Network Assistant

### Note

This can also be the first year of the two-year Computer Support Specialist - IT program on the Green Bay campus.

### Curriculum

The Computer Support Technician - IT Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 35 credits.

#### First Semester

Catalog No.	Description	Credits
10-101-106	Accounting-for Non-Accountants	3
10-154-150	IT:Support:Hardware-Intro	3
10-154-159	IT:Support:Scripting	3
10-154-160	IT:Support:Software-Intro	3
10-801-195	Written Communication	3
10-804-133	Math & Logic	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-102-158	Business-Intro	3
10-152-163	IT:Program:Visual Basic	3
10-154-152	IT:Support:Operating Systems	3
10-154-161	IT:Support:Database Theory	2
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>35</b>

This program is fully eligible for financial aid.

### 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](http://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.*

#### 10-101-106 ACCOUNTING: INTRO FOR NON-

ACCOUNTANTS ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

#### 10-102-158 BUSINESS-INTRODUCTION

...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

#### 10-152-163 IT:PROGRAM:VISUAL BASIC

...introduction to programming using the Visual Basic.NET programming language. Program definition and design, form design, and the coding, testing, and debugging of programs are covered. (Prerequisite: 10-154-159, IT:Support:Scripting or experience using a programming language.)

#### 10-154-150 IT:SUPPORT:HARDWARE-INTRO

...computer/network terminology, component identification, POST, computer/peripheral/printer maintenance, system boards, memory systems, FAT vs. NTFS, operating system/network installations/configurations, internet research, troubleshooting, command line.

#### 10-154-152 IT:SUPPORT:OPERATING SYSTEMS

...explain the role of the microcomputer operating system, implement operating system communications and networking components, perform standard operating system maintenance, and recognize current server and infrastructure device operating systems. (Prerequisite: 10-154-150, IT:Support:Hardware-Intro)

**10-154-159 IT:SUPPORT:SCRIPTING** ...introduction to Windows scripting languages and programming techniques. Scripting methodologies will include Windows shell scripts and Windows Script Hosting using VBScript.

**10-154-160 IT:SUPPORT:SOFTWARE-INTRO** ...an introductory course for the Computer Support Specialist program and covers the fundamental capabilities and functions of Word, PowerPoint, Excel, Email correspondence, Internet search engines, and file compression.

#### 10-154-161 IT:SUPPORT:DATABASE THEORY

...fundamentals of database design and administration, including normalization, design methodology, SQL, integrity rules, database management functions and approaches.

**10-804-133 MATH & LOGIC** ...students will apply mathematical problem solving techniques. Topics will include symbolic logic, sets, algebra, Boolean algebra, and number bases. (Prerequisite: Recommendation:Accuplacer Algebra Test = 61)

# Credit Business Management

Program Code 101145

## Associate Degree

## Business Administration Credit

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Credit Business Management prepares learners for careers in credit management. The learners will comprehend the concepts of leadership, demonstrating promotion, control, and collection of consumer and business transactions.

### Program Outcomes

- Adhere to internal credit policies and procedures.
- Process credit applications.
- Conduct credit investigations.
- Analyze business and consumer financial statements.
- Make credit decisions.
- Use credit related documents.
- Contact customers regarding outstanding balances.
- Negotiate payment proposals with customers.
- Resolve collection issues/problems.
- Resolve discrepancies in customers' accounts.
- Assess how economic policies and changes in the level of business activity affect the credit industry.
- Deliver effective customer service.
- Evaluate the performance of a credit department.
- Demonstrate state and federal laws.
- Manage the work of other people in a team environment.
- Use an electronic word processing computer program.
- Use an electronic spreadsheet computer program.
- Perform basic business math calculations.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math.
- Ability to use computer keyboard.

### Employment Potential

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

**Credit Manager Trainee:** learns all phases of operating a business or financial institution credit department, usually in preparation for a management position.

**Assistant Credit Manager:** assists a department or branch manager in all phases of operation, including the extension, collection, and control of credit.

**Credit Specialist:** supports the credit process in the application of cash receipts, collection calls, and problem resolution.

**Collection Specialist:** contacts consumers or businesses to arrange payments and may become involved with legal aspects of collections.

**Personal Banker:** assists customers in opening accounts, explains bank services, and becomes involved in other financial institution services.

**Loan Officer:** processes and investigates applications for credit and makes decisions on loan applications.

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

- Credit Manager
- Commercial Banker

### Note

- The courses beginning with course numbers 10-114-xxx are delivered in an Accelerated Learning format. These courses have a compressed schedule. The competencies learned in an accelerated class are exactly the same as those in a traditional class. Students are expected to do most assignments outside of class time.
- Learners interested in double majoring in Accounting or Financial Institutions Management should consult with an instructor.
- Refer to the program website for information on accelerated learning and for helpful tips that will assist you in achieving the highest quality and most rewarding academic experience.
- Most credits from this degree can be transferred to some four-year colleges for learners interested in pursuing a bachelor's degree.

### Curriculum

The Credit Business Management Associate Degree is an accelerated program. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-102-158	Business-Intro	3
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-132	Micro: Excel-Part 2	1
10-114-111	Credit-Consumer	4
10-114-117	Credit-Business	4
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-101-110	Accounting 1	4
10-102-150	Law-Business	3
10-114-121	Credit-Management Practices	3
10-114-166	Credit-Collection Methods	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-114-101	Credit-Business Applications	3
10-114-170	Credit-Law	3
10-804-123	Math w Business Apps	3
10-809-195	Economics	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>15</b>

#### Fourth Semester

10-102-181	Financial Statement Analysis	4
10-114-122	Credit-Customer Serv/Sales	3
10-114-146	Credit-Internship	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
	Elective	3
<b>Semester Total</b>		<b>19</b>
<b>Total Credits</b>		<b>67</b>

#### Suggested Electives:

Any course in the Financial Institutions Management or Accounting program.

This program is fully eligible for financial aid.



### 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](http://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.*

**10-101-110 ACCOUNTING 1** ...accounting principles, financial statements, business transactions, accounting cycles/systems, specialized journals, accounting for cash and receivables for sole proprietorships in service or merchandising businesses.

**10-102-150 LAW-BUSINESS** ...common law contracts and sales contracts: formation, interpretation, performance, and discharge; the law of agency; corporations; and introduction to the American legal system: criminal and tort law, and global business issues.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-102-181 FINANCIAL STATEMENT ANALYSIS** ...types of financial statements, analyze financial statements, research company data, perform industry research, examine SEC 10-K and annual report, and write financial analysis report. Highly recommended to be taken in the 4th semester or that the learner have applicable credit or accounting work experience. (Prerequisite: 10-101-110, Accounting 1)

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ...advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

**10-114-101 CREDIT-BUSINESS APPLICATIONS** ...credit, sales, purchasing, shipping, receiving, accounts receivable, accounts payable, and collection procedures, prepare/analyze financial statements, use Excel to solve financial problems, amortization, breakeven, depreciation, gain/loss, and inventory. (Pre-requisite: 10-101-110, Accounting 1)

**10-114-111 CREDIT-CONSUMER** ...the role of consumer credit, loan processes, collections, financial advising and counseling; loan, promotion, and bank policies; consumer, commercial, mortgage loans, and credit cards.

**10-114-117 CREDIT-BUSINESS** ...credit in the business world and company, organizing credit department, policies, procedures, terms of sale, credit investigations, evaluate credit worthiness, support credit decisions, credit forms, international credit and business fraud. (Prerequisite: 10-104-111 OR 10-114-111, Credit-Consumer )

**10-114-121 CREDIT-MANAGEMENT PRACTICES** ...manager's responsibilities/environment, planning, problem solving, organizational structure/cultures, staffing/human resources, leadership/teamwork, motivational techniques, communications, management controls, ineffective performers, and ethical business practices. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending, OR 10-104-117 or 10-114-117, Credit-Business)

**10-114-122 CREDIT-CUSTOMER SERVICES & SALES** ...customer service and sales issues faced by a business credit department, proper phone and face-to-face etiquette with credit customers, and deduction resolution. (Prerequisite: 10-102-166 OR 10-114-166, Credit-Collection Methods)

**10-114-146 CREDIT-INTERNSHIP** ...internship or field observations, career exploration, self exploration, career planning, and career placement. Course should be taken during the last semester.

**10-114-166 CREDIT-COLLECTION METHODS** ...know your debtor, collection laws, pre-legal and legal methods used in collections, negotiating payment proposals, NSF checks, skip tracing, and bankruptcy. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending OR 10-104-117 or 10-114-117, Credit-Business)

**10-114-170 CREDIT-LAW** ...Uniform Commercial Code, credit regulations, Wisconsin Consumer Protection Law, collection law, and bankruptcy. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending OR 10-104-117 or 10-114-117, Credit-Business)

# Criminal Justice - Corrections

Program Code 105042

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Criminal Justice - Corrections students relate theory to current practice trends, problems, and issues and also study correctional counseling, sociology, and security.

### Program Outcomes

- Analyze security procedures.
- Exercise interviewing techniques.
- Examine the state and federal court structure.
- Apply restraints.
- Outline the juvenile and adult criminal justice system.
- Prepare reports.
- Interpret correctional law.
- Summarize probation and parole procedures.
- Demonstrate oral communication skills.
- Compare numerous theories of criminal behavior.
- Contrast various components of the criminal justice system.
- Distinguish numerous functions of community corrections.
- Identify the components that comprise corrections.
- Summarize the administrative and managerial functions within the correctional system.
- Be eligible to become a state certified jail officer.
- Apply basic math skills.
- Demonstrate keyboarding and computer skills.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Good writing and communication skills.
- Strong organizational skills.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Correctional Officer:** monitors, supervises, and informally counsels inmates under his/her control; works cooperatively with other correctional staff; maintains order within the facility; enforces rules and regulations; searches inmates for contraband items such as weapons or drugs; transports inmates; mediates disputes between inmates; enforces discipline; and reports verbally and in writing about inmate conduct and the quality and quantity of work done by inmates.

**Youth Care Worker:** monitors the whereabouts and activities of clients under his/her responsibility, informally counsels, and guides proper personality development of clients.

**Detention Worker:** oversees and monitors juveniles within a secure detention facility, maintains order within the setting, cooperates with staff and law enforcement personnel, is responsible for oral and written communications with a variety of agencies, and is knowledgeable about federal and state laws concerning juvenile rights.

#### Students Seeking Certification as an Officer Can Also:

- Apply principles of subject control.
- Implement jail fire safety.

#### Students Seeking a Certificate in Community Corrections Can Also:

- Understand substance abuse.
- Compare numerous theories of offender treatment.
- Demonstrate methods of computer crime investigation.
- Understand the basics of Workplace Spanish.

#### Students seeking a certificate in alcohol & other drug abuse can also:

- Identify and explain common purposes of group counseling. Plan and carry out a purposeful counseling group activity. Explore the personal and professional characteristics of the counselor.
- Be eligible to become a state certified juvenile detention officer.

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

- Adult/Juvenile Administrator
- Institutional Case Worker/Social Worker
- Probation/Parole Agent
- Youth Counselor/Case Aide
- Youth Detention Home Supervisor

### Note

- Students should be aware that a previous criminal record will limit their opportunity to gain successful employment.
- Wisconsin Training and Standards requires a completed criminal background check in order to successfully complete certification for training standards. Based upon results of the criminal background check, a student may be denied certification.

*continued...*

### Curriculum

The Criminal Justice - Corrections Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-106-145	Keyboarding	1
10-504-114	Police-Nutrition/Fitness	1
10-504-116	Criminal Justice-Intro	3
10-504-122	Correctional Admin	3
10-504-155	Corrections-Community	3
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-504-123	Correctional Inst	3
10-504-133	Correctional Sociology	3
10-504-172	Criminology	3
10-801-136	English Composition 1	3
10-801-198	Speech	3
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-103-121	Micro: Word-Intro	1
10-103-141	Micro: Access-Intro	1
10-504-119	Protective Services-Tech Repor	3
10-504-128	Correctional Interviewing	3
10-504-132	Courts/Jurisdiction	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-504-145	Corrections Law	3
10-504-146	Probation/Parole	3
10-504-147	Correctional Security	3
10-504-154	Youth-Chng Community	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>67</b>

This program is fully eligible for financial aid.

#### Note continued

- If a student chooses to seek the certifiable jail officer track, this student must successfully complete 15 credits of specific courses within the program, fill out an application, complete physical, and complete background check before being eligible to take the following certification requirement courses: Principles of Subject Control (POSC), 10-504-188; Jail Health Care & Fire Safety, 10-504-179.
- Due to Department of Justice - Training and Standards Bureau requirements, transfer of credits for core Criminal Justice courses will not be accepted. The exception to this would be if the courses are from another Wisconsin Technical College who is authorized as a certified Department of Justice - Training and Standards training academy.

### 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](http://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.*

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-106-145 KEYBOARDING** ...keyboarding at a personal productivity level, correct posture, touch typing on the alpha-numeric keyboard using an interactive software package running on a microcomputer. No experience required.

**10-504-114 POLICE-NUTRITION/FITNESS** ...the course will provide an introduction to nutrition and eating correctly for maximum value. Also, an introduction to fitness for a criminal justice professional.

**10-504-116 CRIMINAL JUSTICE-INTRODUCTION** ...criminal justice, crime picture, criminal law, theories of crime, history of policing, police management, legal aspects, courts, corrections, correction facilities.

**10-504-118 PROTECTIVE SERVICES-TECHNICAL REPORTING** ...rationale and methods of law enforcement reporting, principles of effective report writing, organizing reports, writing operational law enforcement reports based on case studies. (Prerequisite: 10-801-136 English Comp 1 or 10-801-175 English Comp 1)

**10-504-122 CORRECTIONAL ADMINISTRATION** ...chain of command, roles of the correctional supervisor, administrative structures, current management practices and problems, personnel needs, organizational theories, mission goals, policy making, inmate discipline, and report writing.

**10-504-123 CORRECTIONAL INSTITUTION** ...the evolution of punishment, development of prisons, southern penal systems, the "Big House" era, prisoner movement, inmate groups, special offender groups, the female offender, prison programs, prison services.

**10-504-129 CORRECTIONAL INTERVIEWING** ...process of correctional interviewing using basic skills model; use of nonverbal and verbal communication; securing admissible confessions that preserve individual's constitutional rights; ethics in criminal justice interviewing.

**10-504-132 COURTS/JURISDICTIONS** ...development of the American judicial system, the Federal and Wisconsin court structure, Wisconsin judicial rules and procedures from complaint to sentencing as they impact police or correctional officers.

**10-504-133 CORRECTIONAL SOCIOLOGY** ...inmate adjustment process, informal organizations, responsibilities of a correctional officer, adult/juvenile admission processes, supervision of "special" inmates, suicide prevention, juvenile detention operations, juvenile release processes, and stress.

**10-504-145 CORRECTIONS LAW** ...laws, rules, and standards affecting jails, Federal and State Court systems, criminal and civil actions, criminal sentences, plea bargaining, community-based sanctions, sentencing statutes and guidelines, prisoner rights, and inmate litigation.

**10-504-146 PROBATION/PAROLE** ...criminal justice system, probation and parole, types of offenses, sentencing process, presentence investigation, revocation procedures, alternatives to incarceration, parole board functions, Parole Officer responsibilities, and guidelines for releasing inmates. (Prerequisite: 10-504-129 Correctional Interviewing)

**10-504-147 CORRECTIONAL SECURITY** ...inmate security control, inspections, movements, counts; resident protection, privacy, safety, searches, contraband, restraints, equipment; building security; detection devices; legal aspects; personnel protection; building clearing; hostage negotiations; and pad subduing techniques.

**10-504-154 YOUTH-CHANGING COMMUNITY** ...juvenile delinquency; historical development controlling children, gangs, family, endangered children; legal requirements of handling juveniles; discipline of juveniles; supervision of juveniles; and community-based programs.

**10-504-155 CORRECTIONS-COMMUNITY** ...criminal justice system stages, community-based corrections, diversion programs, pre-trial release programs, restitution, community service, temporary release programs, halfway houses, female offenders, drug and alcohol abusing offenders, and juvenile programs.

**10-504-172 CRIMINOLOGY** ...nature, extent, and distribution of crime in the United States; biological, psychological, and sociological aspects of crime causation; and legal and political implications of crime prevention and control.



# Criminal Justice - Law Enforcement

Program Code 105041

## Associate Degree

Offered at the Green Bay campus. For information: (920) 498-5444.  
Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Criminal Justice - Law Enforcement students study the law enforcement field plus physical and behavioral sciences to meet the demands of the police profession, including criminal investigation, traffic law, patrol procedures, and scientific crime laboratory.

### Program Outcomes

- Qualify for entry level positions in law enforcement.
- Write reports.
- Apply courtroom testimony techniques.
- Demonstrate knowledge of laws and principles of arrest, search, and seizure.
- Demonstrate understanding of relevant state statutes.
- Interpret selected theories of criminal behavior.
- Describe the structure and procedures of the court system.
- Describe the structure and procedures of the police organization.
- Describe the structure and procedures of corrections.
- Describe the structure and procedures of the juvenile system.
- Investigate an accident.
- Interview suspects and witnesses.
- Process a crime scene.
- Apply investigative techniques.
- Contrast the various police community relations programs.
- Make appropriate judgments on risk and other factors of police situations.
- Describe various patrol tactics.
- Contrast major social institutions within American society.
- Demonstrate effective communication skills.
- Apply basic math skills.
- Demonstrate basic computer skills.
- Students seeking certification can also: Operate vehicles in emergency situations. Demonstrate arrest, search, and seizure.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Good writing and communication skills.
- Strong organizational skills.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Police Officer:** performs general traffic and law enforcement duties at the municipal level.

**Deputy Sheriff:** performs general traffic and law enforcement duties, jailer, and telecommunications responsibilities at the county level.

**DNR Officer:** enforces fish, game, forest, and environmental laws at the state level.

**State Trooper:** performs traffic and law enforcement duties at the state level.

**Military Law Enforcement Officer:** performs criminal investigations, is responsible for traffic assignments, patrol, and general law enforcement duties in any branch of the military service at installations, forts, and bases.

**Private Investigator:** conducts criminal and noncriminal investigations for private businesses and industries.

**Security Guard:** patrols and investigates for retail business and private industrial plants.

**Correctional Officer:** is assigned to security and general duties in a correctional institution.

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

- Police Administrator
- Chief Deputy
- State Agent
- Federal Agent
- Investigator
- K-9 Officer

### Note

- Wisconsin DOJ Training and Standards Bureau requires a completed criminal background check in order to successfully complete certifiable curriculum for training standards. Based upon results of the criminal background check, a student may be denied enrollment in some courses.
- A student must successfully complete 30 credits of core courses within the program, fill out an application, physical, interview and background check before being eligible to take the following certification requirement course: Tactical 1 (10-504-173).
- A student must successfully complete Tactical 1 within the program before being eligible to take the following certification requirement course: Tactical 2 (10-504-174).
- The Department of Justice Law Enforcement Standards Board directive requires that a successful, negative drug test be completed prior to the first enrollment in any of the series of courses necessary for Law Enforcement Officer Certification. Those courses are: Tactical 1 (10-504-173) and Tactical 2 (10-504-174).
- Due to Department of Justice - Training and Standards Bureau requirements, transfer of credits for core Criminal Justice courses will not be accepted. The exception to this would be if the courses are from another Wisconsin Technical College who is authorized as a certified Department of Justice - Training and Standards training academy.

### Curriculum

The Criminal Justice - Law Enforcement Associate Degree is a two-year, four-semester program. Upon graduation a student will have completed 65 credits.

#### First Semester

Catalog No.	Description	Credits
10-106-145	Keyboarding	1
10-504-114	Police-Nutrition/Fitness	1
10-504-116	Criminal Justice-Intro	3
10-504-131	Professional Communication	3
10-504-132	Courts/Jurisdiction	3
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-103-121	Micro: Word-Intro	1
10-103-141	Micro: Access-Intro	1
10-504-142	Constitutional Law	3
10-504-144	Community Police Strategies	3
10-801-136	English Composition 1	3
10-801-198	Speech	3
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-504-112	Traffic Theory	3
10-504-118	Protective Services-Tech Repor	3
10-504-120	Criminal Law	3
10-504-140	Criminal Investigation	3
10-809-166	Intro to Ethics: Theory & App	3
<b>Semester Total</b>		<b>15</b>

#### Fourth Semester

10-504-121	Traffic Application	3
10-504-143	Forensic Application	3
10-504-170	Juvenile Law	3
10-531-101	Emergency Response	1
10-809-172	Race Ethnic & Diversity	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>65</b>

This program is fully eligible for financial aid.

The following courses are needed for Criminal Justice Law Enforcement Certifiability - Advanced Standing Certificate:

- 10-504-173 Tactical 1
- 10-504-174 Tactical 2
- 10-504-182 Police Traffic Radar
- 10-504-126 SFST/Drugs that Impair Driving
- 10-504-128 Interview
- 10-504-176 Internship



### 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](http://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.*

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-106-145 KEYBOARDING** ...keyboarding at a personal productivity level, correct posture, touch typing on the alpha-numeric keyboard using an interactive software package running on a microcomputer. No experience required.

**10-504-112 TRAFFIC THEORY** ...types of patrol and philosophy, concepts, and functions: types of calls and procedures: information gathering and reporting; patrol responsibility at crime scenes; courtroom procedures; and community relations.

**10-504-114 POLICE-NUTRITION/FITNESS** ...the course will provide an introduction to nutrition and eating correctly for maximum value. Also, an introduction to fitness for a criminal justice professional.

**10-504-116 CRIMINAL JUSTICE-INTRODUCTION** ...criminal justice, crime picture, criminal law, theories of crime, history of policing, police management, legal aspects, courts, corrections, correction facilities.

**10-504-118 PROTECTIVE SERVICES-TECHNICAL REPORTING** ...rationale and methods of law enforcement reporting, principles of effective report writing, organizing reports, writing operational law enforcement reports based on case studies. (Prerequisite: 10-801-136 English Comp 1 or 10-801-175 English Comp 1)

**10-504-120 CRIMINAL LAW** ...criminal law characteristics; terminology, history, principles, and philosophy of criminal law; use of the Wisconsin Statute Book; and examination of selected criminal offenses and identifying elements.

**10-504-121 TRAFFIC APPLICATION** ...fundamentals of evaluating the traffic law; process of issuing traffic citations and investigating and completing traffic accident reports; the process for safe traffic stops: low and high risk.

**10-504-131 PROFESSIONAL COMMUNICATION** ...process of criminal justice interviewing using basic skills model; use of nonverbal and verbal communication; security admissible confessions that preserve individual's constitutional rights; ethics in criminal justice interviewing.

**10-504-132 COURTS/JURISDICTIONS** ...development of the American judicial system, the Federal and Wisconsin court structure, Wisconsin judicial rules and procedures from complaint to sentencing as they impact police or correctional officers.

**10-504-140 CRIMINAL INVESTIGATION** ...principles of criminal investigation; focus on techniques of an investigation from the preliminary investigation interview, evidence procedures, and specific crime investigation.

**10-504-142 CONSTITUTIONAL LAW** ...arrest and search and seizure of persons, places, and things with or without warrant; cause and procedure to obtain and execute warrants; exclusionary rule and effects of illegal actions.

**10-504-143 FORENSIC APPLICATION** ...processing of crime scenes and use of forensic science in criminal investigations; emphasis on collection, preservation, and court presentation of fingerprint, firearm, impression, trace, body fluid, and document evidence.

**10-504-144 COMMUNITY POLICE STRATEGIES** ...history of community policing, community, police, problem-solving policing, interpersonal skills, diversity, citizens with disabilities, elderly, youth, gangs, victims/witnesses, media, and community police programs.

**10-504-170 JUVENILE LAW** ...as it relates to the field officer and the application of the law as it relates to juveniles in these situations.

**10-531-101 EMERGENCY RESPONSE** ...legal/ethical issues, initial medical assessment, immediate treatment for a variety of injuries and medical conditions, CPR, defibrillation and response to hazardous materials.

# Criminal Justice - Law Enforcement Academy Program Code 305041

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

## Program Description

The full-time Criminal Justice Law Enforcement Academy is a 17-credit, 594-hour, 13-week program designed to produce thoroughly competent and confident officers. Students learn the many skills of modern-day law enforcement and practice these skills in realistic environments. The realism afforded by our tactical facilities is unmatched in providing scenario-based training. Graduates of the Academy begin their career with an unparalleled level of professionalism as well as the ability to confront threats of terror to our homeland security.

The Academy faculty comprises a cross-section of full-time educators, law enforcement officers, supervisors and administrators who are established as leaders in law enforcement training. Staff members recognize they are role models of what is being taught and mentors to those attending.

## Program Outcome

A graduate will be certifiable as a law enforcement officer in the state of Wisconsin.

## Requirement For Program Entry

- Completed application.
- An Associate Degree in Criminal Justice, 60 college credits, or current employment with a sponsoring law enforcement agency.
- Self-sponsored applicants must complete an NWTC application, form DJ-LE-330 (with essays completed), physician's assessment and have official college transcript(s) sent to NWTC. These candidates must also submit to a background check (at applicant's expense), physical fitness assessment and personal interview. Once accepted, these individuals must also complete a drug screen at their own expense.
- Currently employed officers must complete the NWTC application and provide contact information for their agency training officer who will be required to submit a copy of the officer's DJ-LE-303 form and complete additional paperwork. For further details on the application process for employed officers, contact the NWTC Public Safety Department at (920) 491-2627.

## Employment Potential

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

**Police Officer:** performs general traffic and law enforcement duties at the municipal level.

**Deputy Sheriff:** performs general traffic and law enforcement duties, jailer and telecommunications responsibilities at the county level.

**DNR Officer:** enforces fish, game, forest and environmental laws at the state level.

**State Trooper:** performs traffic and law enforcement duties at the state level.

**Military Law Enforcement Officer:** performs criminal investigations, is responsible for traffic assignments, patrol and general law enforcement duties in any branch of the military service at installations, forts and bases.

**Private Investigator:** conducts criminal and non-criminal investigations for private business and industry.

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

- Police Administrator
- Chief Deputy
- State Agent
- Federal Agent

## Note

- Regardless of prior college credit, all courses must be completed to obtain certifiability with the Law Enforcement Standards Board of the Wisconsin Department of Justice.
- This program does not qualify for financial aid as it does not last an entire semester. Veterans' Benefits may be used to cover material and program fees. Contact Enrollment Services for details. A payment plan is also available.
- The credits earned through successful completion of this program do not count toward the 60-credit requirement imposed by Wisconsin Administrative Code Section LES 2.01(1)(e) for employed officers. However, academy credits may be applied toward an Associate Degree in Criminal Justice to partially satisfy the college credit requirement.

## Curriculum

Upon graduation, a student will have completed 17 credits and will be certifiable as a law enforcement officer in the state of Wisconsin.

### First Semester

Catalog No.	Description	Credits
30-504-337	Policing in America	1
30-504-338	Legal Context	1
30-504-339	Tactical Skills	3
30-504-340	Relational Skills	3
30-504-341	Patrol Procedures	3
30-504-342	Investigations	2
30-504-343	OMVWI/SFST	1
30-504-345	Police-Fit to Serve	2
30-504-346	Scenario Evaluation	1
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>17</b>

### 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](http://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.*

**30-504-337 POLICING IN AMERICA** ... students learn rules and procedures of Academy; various elements of Criminal Justice System and the Role of Law Enforcement. Students explore belief systems, social pressures, moral problems, decision making.

**30-504-338 LEGAL CONTEXT** ...students will learn the structure of Criminal Justice System including criminal procedure, arrest, use of force, search, and seizure, the limits on law enforcement activity, classification and elements of crimes.

**30-504-339 TACTICAL SKILLS** ...students will learn the basis for and the limits to use of force by Wisconsin officers. The specific techniques for intervention will range from empty hands to use of firearms.

**30-504-340 RELATIONAL SKILLS** ...students write law enforcement reports, role of communication while developing specific skills/strategies for handling emotionally disturbed people, legal basis for emergency placements, testifying in court, community policing strategies.

**30-504-341 PATROL PROCEDURES** ...students study Wisconsin traffic laws & how to enforce. Investigation of traffic crashes, crash scene management. Emergency vehicle operation, pursuit guidelines, conducting legal basis vehicle contacts. Arrest procedures, OWI, Emergency Medical Services.

**30-504-342 INVESTIGATIONS** ...students learn techniques, procedures for interviewing and interrogating. Learn to recognize and handle evidence, the correct law enforcement response to a victim of crime, statutory elements and procedures for sensitive crimes.

**30-504-343 OMVWI/SFST** ...students will learn to recognize and interpret evidence of OMVWI violation, administer and interpret standardized field sobriety tests, make appropriate enforcement decisions, prepare arrest reports and complete associated paperwork.

**30-504-345 POLICE-FIT TO SERVE** ...the course will provide an introduction to nutrition and eating correctly for maximum value. Also, an introduction to fitness for a criminal justice professional.

**30-504-346 SCENARIO EVALUATION** ...uses scenarios developed by the WI DOJ to evaluate six core abilities critical to success in law enforcement: decision making; tactical skills; emergency management; investigative skills; written and interpersonal communication.





# Dental Assistant

Program Code 315081

## Technical Diploma

Offered at the Green Bay campus. For information: (920) 498-5444.  
Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Dental Assistant program prepares students for a professional career in Dental Assisting. Upon graduation the student will be proficient in assisting during patient care in a dental office. The program is designed to provide students with the skills and knowledge necessary to become a valuable member of the dental team.

### Program Outcomes

- Collect diagnostic and treatment data.
- Manage infection and hazard control.
- Perform clinical supportive treatments.
- Take diagnostic radiographs.
- Perform dental laboratory procedures.
- Provide patient oral health instruction.
- Assist in managing medical emergencies.
- Model professional behaviors, ethics, and appearance.
- Carry out dental office procedures.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase personal protection equipment/clothes, pay for liability insurance for dental clinical experience courses, provide their own transportation to the dental office, and attend a two-day dental convention in Chicago or Milwaukee.

Students are required to complete an American Heart Association Health Care Provider CPR course during their first semester.

Complete physical/dental examinations and Hepatitis vaccination prior to second semester Dental Assistant Clinical.

### Accreditation

The Dental Assistant program is accredited by the American Dental Association-Commission on Dental Accreditation.

### Board/Certification Examinations

Graduates of the program are eligible to take the national certification exam offered by the Dental Assisting National Board (DANB), (312) 642-3368.

### Employment Potential

The program prepares graduates to work with dentists as they examine and treat patients. Dental assistants may carry out a variety of laboratory, clinical, and office duties, such as patient scheduling and bookkeeping functions. Dental assistants typically work in general or specialty dental offices. Some dental assistants may work for insurance companies, dental lab studios, or dental supply companies. The dental assistant may also find employment with federal agencies such as the Veterans Administration, US Public Health Services, the Armed Forces, or a state, county, or city health facility.

#### Graduates may find employment as a:

- Dental Assistant
- Dental Office Manager
- Dental Laboratory Assistant
- Dental Laboratory Technician
- Dental Treatment Coordinator
- Maxillofacial Dental Assistant
- Endodontic Dental Assistant
- Prosthodontic Dental Assistant
- Dental Receptionist
- Dental Practice Manager
- Dental Sales Representative
- Orthodontic Dental Assistant
- Pediatric Dental Assistant
- Periodontic Dental Assistant

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment, ACT assessment taken within the last three years, or youth options student.

### Requirements for Program Entry

- Meet established Academic Skills Assessment program benchmarks, or minimum standard composite score of 14 on the ACT with acceptable scores in Math, Reading, and English. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory program orientation.
- Submit Caregiver Background Check paperwork.

### Suggested Skills for Success

Students are expected to have entry-level computer and keyboarding skills. It is recommended that students complete basic computer skills coursework if deficient in this area.

A science background with emphasis in Advanced Biology and Anatomy and Physiology is highly recommended.

### Scholarships

The Brown-Door-Kewaunee Dental Society, the Northeast Wisconsin Dental Assistant Association, and the NWTC Dental Assistant Program offer four scholarships: (2) \$500.00, (1) \$200.00, and (1) \$150.00, to students in the Dental Assistant program. Criteria include financial need, grade point average, and attendance. NWTC also has other scholarships available to students.

### Curriculum

The Dental Assistant Technical Diploma is a one-year, three-semester program. Upon graduation, a student will have completed 32 credits.

The second and third semesters are 14 weeks on campus and three weeks off campus for clinical experience.

Start dates for the first semester are June and August.

#### First Semester

Catalog No.	Description	Credits
* 10-508-101	Dental Health Safety	1
* 31-508-304	Dental and General Anatomy	2
* 31-508-307	Dental Assistant Professional	1
<b>Semester Total</b>		<b>4</b>

#### Second Semester

* 10-508-103	Dental Radiography	2
* 10-508-113	Dental Materials	2
* 31-508-302	Dental Chairside	5
* 31-508-306	Dental Assistant Clinical	3
** 31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>13</b>

#### Third Semester

* 10-508-120	Dental Office Mgmt	2
* 31-508-308	Dental Chairside Advanced	5
* 31-508-309	Dental Lab Procedures	4
* 31-508-310	Dental Radiography - Advanced	1
* 31-508-311	Dental Asst Clinical-Advanced	2
** 31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>32</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or received a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team.

\*\* Students may take Communicating-Writing (31-508-385) and Communicating-Effectively (31-801-386) any semester.

The following courses will transfer into the Dental Hygiene Associate Degree program:

- 10-508-101, Dental Health Safety
- 10-508-103, Dental Radiography Application
- 10-508-113, Dental Materials
- 10-508-120, Dental Office Management

It is recommended that students interested in pursuing a degree in Dental Hygiene should take 10-801-195, Written Communication OR 10-801-196, Oral/Interpersonal Communications, which replaces both 31-801-385 and 31-801-386.

This program is fully eligible for financial aid.



## 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](http://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.*

**10-508-101 DENTAL HEALTH SAFETY** ...prepares dental auxiliary students to respond proactively to dental emergencies, control infection, prevent disease, adhere to OSHA Standards, and safely manage hazardous materials. Students also take patient vital signs and collect patient medical/dental histories. CPR certification is a prerequisite; students will be required to show proof of certification before beginning the course. (Prerequisite: Accepted into the Dental Hygiene or Dental Assistant Programs)

**10-508-103 DENTAL RADIOGRAPHY APPLICATIONS** ...prepares dental auxiliary students to operate x-ray units and expose bitewing, periapical, extra oral, and occlusal radiographs. Emphasis is placed on protection against x-ray hazards. Students also process, mount, and evaluate radiographs for diagnostic value. In this course students demonstrate competency on a manikin. In addition, students expose bitewing radiographs on a peer, role-play patient. (Prerequisites: 10-508-101, Dental Health Safety AND 10-508-102, Oral Anat & Hist OR 31-508-304, Dental and General Anat)

**10-508-113 DENTAL MATERIALS** ...prepares dental auxiliary students to handle and prepare dental materials such as liners, bases, cements, amalgam, resin restorative materials, gypsum products, and impression materials. They also learn to take alginate impressions on manikins and clean removable appliances. (Prerequisites: 10-508-101, Dental Health Safety; 31-508-304, Dental & General Anatomy.)

**10-508-120 DENTAL OFFICE MANAGEMENT** ...prepares dental auxiliary students to manage telephones, appointments, recall systems, and inventory. Students also develop the skills need to process accounts receivable and payable, collections, and third party reimbursements. (Prerequisite: Enrolled in Dental Assistant or Dental Hygiene Program)

**31-508-302 DENTAL CHAIRSIDE** ...prepares dental assistant students to chart oral cavity structures, dental pathology, and restorations and to assist a dentist with basic dental procedures including examinations, pain control, amalgam restoration, and cosmetic restoration. Students will also develop the ability to educate patients about preventive dentistry, brushing and flossing techniques, and dental procedures, using lay terminology. Throughout the course, students will apply decoding strategies to the correct use and interpretation of dental terminology. (Prerequisites: 10-508-101, Dental Health Safety; 31-508-304, Dental & General Anatomy; Corequisite: 10-508-113, Dental Materials)

**31-508-304 DENTAL AND GENERAL ANATOMY** ...prepares dental assistant students to apply fundamentals of general and dental anatomy to informed decision-making and to professional communication with colleagues and patients. (Corequisite: 10-508-101, Dental Health Safety; 31-508-307, Dental Asst Professionalism)

**31-508-306 DENTAL ASSISTANT CLINICAL** ...students apply skills developed in Dental and General Anatomy, Dental Health Safety, Dental Chairside, Dental Materials, Dental Radiography, and Professionalism in a clinical setting with patients. Emphasizes integration of core abilities and basic occupational skills. (Prerequisites: 10-508-101, Dental Health Safety; 31-508-304, Dental & General Anatomy; 31-508-307, Dental Assistant Professionalism; Corequisites: 31-508-302, Dental Chairside; 10-508-113, Dental Materials; 10-508-103, Dental Radiography Applications)

**31-508-307 DA-DENTAL ASSISTANT PROFESSIONALISM** ...prepares dental assistant students for professional success in a dental practice or another dental health care environment. Students develop professional appearance and image. More importantly, they learn to work within ethical guidelines and legal frameworks. In preparation for entering the work force, dental assistants customize or develop their portfolios and lay out an on-going professional development plan. (Corequisites: 10-508-101, Dental Hygiene Safety; 31-508-304, Dental & General Anatomy)

**31-508-308 DENTAL CHAIRSIDE - ADVANCED** ...prepares dental assistant students to adapt chairside skills to assisting with dental specialties as they are performed in general practice. Focuses on pediatric dentistry, orthodontics, oral maxillofacial surgery, endodontics, periodontic, and prosthodontics. Students will also develop the ability to assist with sealants, perform coronal polishing, and apply topical fluoride and topical anesthetics. (Prerequisites: 31-508-302, Dental Chairside; 31-508-306, Dental Assistant Clinical; Corequisite: 31-508-309, Dental Lab Procedures)

**31-508-309 DENTAL LABORATORY PROCEDURES** ...prepares Dental Assistant students to produce alginate impressions and fabricate diagnostic models, oral appliances, temporary restorations, and custom trays. Students also polish oral appliances. (Prerequisites: 31-508-304, Dental & Gen Anatomy; 10-508-113, Dental Materials; Corequisite: 31-508-308, Dental Chairside-Advanced)

**31-508-310 DENTAL RADIOGRAPHY - ADVANCED** ...builds on principles and skills developed in Dental Radiography. Dental Assisting students expose full mouth series, extra-oral and specialized radiographs on adult and child patients. Emphasis is placed on protection against x-ray hazards. Students will also process, mount, and evaluate radiographs for diagnostic value. In addition, they will use radiographs to explain dental health and treatment plans to patients. (Prerequisite: 10-508-103, Dental Radiography Applications; Corequisite: 31-508-311, Dental Assistant Clinical Advanced)

**31-508-311 DENTAL ASSISTANT CLINICAL - ADVANCED** ...Dental Assisting students apply skills developed in Dental Chairside - Advanced, Dental Lab Procedures, Dental Radiography - Advanced, and Dental Office Procedures in a clinical setting with patients. Emphasizes integration of core abilities and basic and advanced occupational skills. (Prerequisite: 31-508-306, Dental Asst Clinical; Corequisites: 31-508-308, Dental Chairside Advanced; 31-508-309, Dental Lab Procedures; 31-508-310, Dental Radiography Advanced; 10-508-120, Dental Office Management)

# Dental Hygienist

Program Code 105081

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Dental Hygienist program prepares students to perform oral prophylaxis, apply preventive agents, expose radiographs, and teach patients oral care.

### Program Outcomes

- Incorporate into dental hygiene practice professional laws, regulations and policies established by the licensing state and regulatory agencies.
- Model dental hygiene professional code of ethics in a rapidly changing environment.
- Pursue lifelong professional growth and development through self-directed learning, participation in professional organizations, and continuing education.
- Counsel clients/patients to reduce health risks.
- Provide community oral health services in a variety of settings.
- Manage infection and hazard control.
- Assess data on all aspects of patient/client health using methods consistent with dental hygienist scope of practice and legal principles.
- Formulate a comprehensive dental hygiene care plan in collaboration with the client and other health professionals.
- Provide preventive and therapeutic services that promote oral health according to the needs of the patient/client.
- Evaluate the effectiveness of the implemented client/patient dental hygiene care plan and modify as needed.
- Evaluate the effectiveness of the implemented clinical and educational services and modify as needed.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, instruments, pay for liability insurance, and cover any other expenses related to clinical experiences.

**Accreditation** The Dental Hygienist program is accredited by the American Dental Association - Commission on Dental Accreditation  
211 East Chicago Avenue  
Chicago, IL 60611-2678  
(312) 440-2500

### Employment Potential

Prior to licensure as a Registered Dental Hygienist, a student is required to pass the Dental Hygiene National Board Examination and the American Dental Hygiene Examination. A registered Dental Hygienist may practice dental hygiene in a health department, private practice, long term care facility, or school. Graduates may find employment on a part-time or full-time basis.

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

- Dental Hygiene Instructor
- Public Health Dental Hygienist
- Dental Laboratory Technician
- Dental Sales
- Dental Insurance Review Analyst

### Board/Certification Examinations

Graduates are qualified to take the American Board of Dental Hygiene Licensing Exam (formerly known as the Central Regional Dental Testing Exam) and the National Board Dental Hygiene Examination.

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- Two semesters High School, or one semester in College of: Algebra, Advanced Math, Biology, and Chemistry.
- All required course grades must be a "C" or better.

### Priority Admission

Applicants with documentation of completion of General Anatomy and Physiology, with a "B" or better, will receive priority standing among that year's applicant pool.

### Requirements for Program Entry

- Meet established Academic Skills Assessment program benchmarks, or achieve minimum standard composite score of 20 on the ACT with acceptable scores in Math, Reading, and English. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory spring Program Orientation.
- Complete physical and dental examinations within three months before entering program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card to comply with affiliating agency requirements.
- Submit Caregiver Background Check paperwork.

### Curriculum

The Dental Hygienist Associate Degree is a two-year, two-summer, six-semester program. Upon graduation, a student will have completed 69 credits.

#### Summer Semester

Catalog No.	Description	Credits
* 10-508-101	Dental Health Safety	1
* 10-806-177	Gen Anatomy & Physiology	4
* 10-806-186	Intro to Biochemistry	3
<b>Semester Total</b>		<b>8</b>

#### First Semester

* 10-508-102	Oral Anatomy, Embry, Histology	4
* 10-508-105	Dental Hygiene Process 1	4
* 10-508-107	Dental Hygiene Ethics & Profes	1
10-801-195	Written Communication	3
* 10-806-197	Microbiology	4
<b>Semester Total</b>		<b>16</b>

#### Second Semester

* 10-508-103	Dental Radiography	2
* 10-508-106	Dental Hygiene Process 2	4
* 10-508-108	Periodontology	3
* 10-508-109	Cariology	1
* 10-508-111	General & Oral Pathology	3
<b>Semester Total</b>		<b>13</b>

#### Summer Semester

* 10-508-110	Nutrition and Dental Health	2
<b>Semester Total</b>		<b>2</b>

#### Third Semester

* 10-508-112	Dental Hygiene Process 3	5
* 10-508-113	Dental Materials	2
* 10-508-114	Dental Pharmacology	2
* 10-508-115	DH-Community Dental Health	2
10-801-196	Oral/Interpersonal Comm	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

* 10-508-116	Dental Pain Management	1
* 10-508-117	Dental Hygiene Process 4	4
10-809-172	Race Ethnic & Diversity	3
10-809-196	Intro to Sociology	3
	Elective	2
<b>Semester Total</b>		<b>13</b>
<b>Total Credits</b>		<b>69</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or received a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team.

#### Suggested Electives:

DH-Dental Career Transition, 10-508-118  
DH-Dental Hygiene Board Review, 10-508-119  
Spanish for the Dental Team, 10-802-103

This program is fully eligible for financial aid.

## 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](http://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.*

**10-508-101 DENTAL HEALTH SAFETY** ...prepares dental auxiliary students to respond proactively to dental emergencies, control infection, prevent disease, adhere to OSHA Standards, and safely manage hazardous materials. Students also take patient vital signs and collect patient medical/dental histories. CPR certification is a prerequisite; students will be required to show proof of certification before beginning the course. (Prerequisite: Accepted into the Dental Hygiene or Dental Assistant Programs)

**10-508-102 ORAL ANATOMY, EMBRYOLOGY AND HISTOLOGY** ...prepares Dental Hygienist students to apply detailed knowledge about oral anatomy to planning, implementation, assessment, and evaluation of patient care. Students identify distinguishing characteristics of normal and abnormal dental, head, and neck anatomy and its relationship to tooth development, eruption and health. (Prerequisites: 10-806-177, General Anatomy & Physiology, 10-508-101, Dental Health Safety)

**10-508-103 DENTAL RADIOGRAPHY APPLICATIONS** ...prepares dental auxiliary students to operate x-ray units and expose bitewing, periapical, extra oral, and occlusal radiographs. Emphasis is placed on protection against x-ray hazards. Students also process, mount, and evaluate radiographs for diagnostic value. In this course students demonstrate competency on a manikin. In addition, students expose bitewing radiographs on a peer, role-play patient. (Prerequisites: 10-508-101, Dental Health Safety AND 10-508-102, Oral Anat & Hist OR 31-508-304, Dental and General Anat)

**10-508-105 DENTAL HYGIENE PROCESS 1** ...introduces Dental Hygiene students to the basic technical/clinical skills required of practicing Dental Hygienists including use of basic dental equipment, examination of patients, and procedures within the dental unit. Under the direct supervision of an instructor, students integrate hands-on skills with entry-level critical thinking and problem-solving skills. The course also reinforces the application of Dental Health Safety skills. (Prerequisite: 10-508-101, Dental Health Safety; Corequisite: 10-508-102, DH-Oral Anatomy & Histology)

**10-508-106 DENTAL HYGIENE PROCESS 2** ...this clinical course builds on and expands the technical/clinical skills student dental hygienists began developing in Dental Hygiene Process I. Under the direct supervision of an instructor, students apply patient care assessment, planning, implementation, and evaluation skills to provide comprehensive care for perio case type 0, I, and II patients. (Prerequisite: 10-508-105, DH-Dental Hygiene Process 1)

**10-508-107 DENTAL HYGIENE ETHICS & PROFESSIONALISM** ...helps student dental hygienists develop and apply high professional and ethical standards. Students apply the laws that govern the practice of dental hygiene to their work with patients, other members of a dental team and the community. Emphasis is placed on maintaining confidentiality and obtaining informed consent. Students enhance their ability to present a professional appearance. (Prerequisite: Accepted in the Dental Hygienist Program)

**10-508-108 PERIODONTOLOGY** ...this course prepares student dental hygienists to assess the periodontal health of patients, plan prevention and treatment of periodontal disease, and to evaluate the effectiveness of periodontal treatment plans. Emphasis is placed on the recognition of the signs and causes of periodontal disease and on selection of treatments modalities that minimize risk and restore periodontal health. (Prerequisites: 10-806-197, Microbiology; 10-806-186, Intro to Biochemistry; 10-508-102, DH Oral Antmy, Histlogy & Embrylgy; Corequisites: 10-508-111, DH-Gen & Oral Pathology; 10-508-103, Dental Radigrphy App; 10-508-106, DH-Dental Hygiene Proc 2)

**10-508-109 CARIOLOGY** ...this course focuses on the characteristics and contributing factors of dental decay. Dental Hygiene students help patients minimize caries risk by developing treatment plans, communicating methods to patients, and evaluating treatment results. (Prerequisites: 10-806-186, Intro to Biochemistry; 10-806-197, Microbiology; Corequisite: 10-508-106, Dental Hygiene Process 2)

**10-508-110 NUTRITION AND DENTAL HEALTH** ...prepares student dental hygienists to counsel patients about diet and its impact on oral health. Students learn to distinguish between balanced and unbalanced diets and to construct diets that meet the needs of patients with compromised dental/oral health. Students also learn to counsel patients about the effect of eating disorders on dental health. (Prerequisites: 10-508-109, DH-Cariology; 10-806-186, Intro to Biochemistry)

**10-508-111 GENERAL & ORAL PATHOLOGY** ...this course prepares the student dental hygienist to determine when to consult, treat or refer clients with various disease, infection or physiological conditions. Students learn to recognize the signs, causes, and implications of common pathological conditions including inflammatory responses, immune disorders, genetic disorders, developmental disorders of tissues and cysts, oral tissue trauma, and neoplasm of the oral cavity. (Prerequisites: 10-508-102, Oral Anatomy, Embryology & Histology; Corequisite: 10-508-103, Dental Radiography Applications)

**10-508-112 DENTAL HYGIENE PROCESS 3** ...this clinical course builds on and expands the technical/clinical skills student dental hygienists developed in Dental Hygiene Process II. In consultation with the instructor, students apply independent problem-solving skills in the course of providing comprehensive care for perio case type 0, I, II, and III patients. Dental Hygiene Process 3 introduces root detoxification using hand and ultra-sonic instruments, manipulation of files, selection of dental implant prophylaxis treatment options, and administration of chemotherapeutic

agents. Students also adapt care plans in order to accommodate patients with special needs. (Prerequisites: 10-508-106, Dental Hygiene Process 2; 10-508-108, Periodontology; 10-508-109, Cariology; 10-508-110, DH-Nutrition & Dental Health)

**10-508-113 DENTAL MATERIALS** ...prepares dental auxiliary students to handle and prepare dental materials such as liners, bases, cements, amalgam, resin restorative materials, gypsum products, and impression materials. They also learn to take alginate impressions on manikins and clean removable appliances. (Prerequisites: 10-508-101, Dental Health Safety; 31-508-304, Dental & General Anatomy.)

**10-508-114 DENTAL PHARMACOLOGY** ...prepares student dental hygienists to select safe and effective patient premedication, local anesthetic, chemo therapeutic and anti-microbial agents within the scope of dental hygiene practice. Students will also learn to recognize potential pharmacological contraindications for specific patients and to take measures to avoid negative impact or alert other members of the dental team to possible negative impact. (Prerequisites 10-806-186, Intro to Biochemistry; 10-806-197, Microbiology; Corequisite: 10-508-112, Dental Hygiene Process 3)

**10-508-115 DH-COMMUNITY DENTAL HEALTH** ...this course prepares the Dental Hygienist student to play a proactive role in improving the dental health of community members of all ages. Students perform and interpret dental health research to determine community dental health needs, they also participate in the development, implementation and evaluation of a community dental health program. (Corequisite: 10-508-112, Dental Hygiene Process 3)

**10-508-116 DENTAL PAIN MANAGEMENT** ...this course prepares the student dental hygienist to work within the scope of dental hygiene practice to manage pain for dental patients. Students learn to prevent and manage common emergencies related to administration of local anesthesia, prepare the armamentarium, and administer local anesthesia. The course also addresses the recommendation of alternative pain control measures. (Prerequisites: 10-508-102, Oral Anatomy, Embryology & Histology; 10-508-114, Dental Pharmacology; 10-508-112, Dental Hygiene Process 3)

**10-508-117 DENTAL HYGIENE PROCESS 4** ...this clinical course builds on and expands the technical/clinical skills student dental hygienists developed in Dental Hygiene Process III. With feedback from the instructor, students manage all aspects of cases in the course of providing comprehensive care for perio case type 0, I, II, and III patients. Emphasizes maximization of clinical efficiency and effectiveness. Prepares student dental hygienists to demonstrate their clinical skills in a formal examination situation. (Prerequisites: 10-508-112, Dental Hygiene Process 3; Corequisite: 10-508-116, Dental Pain Management)



# Diagnostic Medical Sonography

Program Code 105262

## Associate Degree

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

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

### Program Description

Graduates perform routine sonographic (ultrasound) examinations of the body to include the abdomen, small parts, obstetrics, and gynecology. They work closely with physicians and may assist in the performance of invasive procedures.

### Program Outcomes

- Provide patient care and education.
- Apply principles of physics and instrumentation to sonography.
- Apply principles of anatomy and pathophysiology to sonography.
- Obtain high quality diagnostic sonographic images.
- Adhere to the professional code of ethics for sonographers.
- Communicate with members of the healthcare team.
- Adhere to universal precautions.
- Model professional behaviors and appearance.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances, participate in p.m. clinicals, or weekend rotations.

Students are required to complete an American Heart Association Health Care Provider CPR course prior to clinical experiences. Students are required to maintain a current CPR card to comply with affiliating agency requirements.

### Accreditation

The Diagnostic Medical Sonography program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP)  
1361 Park Street  
Clearwater, FL 33756  
(727) 210-2350

### Employment Potential

A graduate of the Diagnostic Medical Sonography program can choose to work in a variety of health care settings including clinics, hospitals, private practice physician offices, public health facilities and laboratories performing examinations in their areas of specialization.

Career advancement opportunities exist in education, administration, research, and in commercial companies as education/application specialists, sales representatives, and technical advisors.

### Board/Certification Examinations

Graduates are qualified to take the Obstetric/Gynecology, Abdomen, and Physics Boards through the Association of Registered Diagnostic Medical Sonographers (ARDMS).

### Requirements For Program Application

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- One year of Algebra, Biology, Chemistry, and Physics with a grade of "C" or better. If high school courses, "C" in two semesters of each.

Candidates submitting applications to the DMS program must also provide:

- Three references from professional or academic experiences submitted on NWTC forms.
- An essay (no more than 1,000 words) completed on campus in the Assessment Center in a timed setting. The essay must include why they are interested in and their knowledge of the profession, experience in healthcare, specific skills and duties of a sonographer, and characteristics that make them a good candidate for the program.

The DMS program follows a competitive enrollment process whereby candidate applications are reviewed by a Selection Committee. Candidates are ranked in the following categories: Assessment, Math/Science, Essays, References. The highest ranking candidates will be offered a place on the program wait list. Remaining candidates will have the opportunity to re-apply.

### Requirements for Program Entry From Wait List

- Attend mandatory spring Program Orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Submit Caregiver Background Check paperwork.
- Complete mandatory four-hour job shadow.

### Suggested Skills for Success

Students are expected to have entry-level computer skills. It is recommended that students complete basic computer skills coursework if deficient in this area.

### Curriculum

The Diagnostic Medical Sonography program is a two-year, one-summer, five-semester program. Upon graduation a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
* 10-526-204	DMS-Intro to DMS	3
* 10-526-205	DMS-Patient Care & Ethics	3
* 10-526-210	DMS-Cross Sectional Anatomy	2
* 10-806-177	Gen Anatomy & Physiology	4
<b>Semester Total</b>		<b>15</b>

#### Second Semester

* 10-526-206	DMS-Sono Physics & Instrument	3
* 10-526-207	DMS-Abdominal Sonography	4
* 10-526-208	DMS-OB/GYN Sonography 1	3
10-801-195	Written Communication	3
* 10-806-179	Adv Anatomy & Physiology	4
<b>Semester Total</b>		<b>17</b>

#### Summer Semester

* 10-526-220	DMS-Scan with Proficiency	1
10-801-196	Oral/Interpersonal Comm	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>7</b>

#### Third Semester

* 10-526-209	DMS-DMS Clinical 1	2
* 10-526-211	DMS-Sono of Superficial Struct	2
* 10-526-212	DMS-OB/GYN Sonography 2	3
* 10-526-213	DMS-DMS Clinical 2	4
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>14</b>

#### Fourth Semester

* 10-526-214	DMS-Intro to Cardiac & Vasc	3
* 10-526-215	DMS-DMS Clinical 3	4
* 10-526-216	DMS-DMS Clinical 4	2
* 10-526-217	DMS-Registry Review	1
10-809-172	Race Ethnic & Diversity	3
	Elective	2
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>68</b>

\* No final grade lower than "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

This program is fully eligible for financial aid.



## 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](http://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.*

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-526-204 DMS-INTRO TO DIAGNOSTIC MEDICAL SONOGRAPHY** ...introduces learners to the field of Diagnostic Medical Sonography. Explores the duties and functions of the Diagnostic Medical Sonographer as well as the historical background. (Prerequisite: Accepted into the Diagnostic Medical Sonography Program.)

**10-526-205 DMS-PATIENT CARE AND ETHICS** ...introduces the principles of patient care including patient assessment, monitoring, handling and transporting. Legal and ethical issues related to Sonography are also examined. (Prerequisite: Accepted into the Diagnostic Medical Sonography Program.)

**10-526-206 DMS-SONOGRAPHY PHYSICS AND INSTRUMENTATION** ...introduces physics and instrumentation relevant to diagnostic medical sonography. Learners explore how principles of sound propagation in tissues create a sonographic image. (Prerequisites: 10-526-204, DMS-Intro to DMS; 10-526-205, DMS-Patient Care & Ethics)

**10-526-207 DMS-ABDOMINAL SONOGRAPHY** ...prepares learners to perform ultrasounds of the abdominal organs including liver, gallbladder, biliary tree, pancreas, spleen, urinary tract, aorta and retroperitoneum. Practice scan sessions included. (Prerequisites: 10-526-204, DMS-Intro to DMS; 10-526-205, DMS-Patient Care & Ethics; 10-501-101, Medical Terminology; 10-806-177, Gen Anatomy & Physiology; Corequisite: 10-806-179, Adv Anatomy & Physiology)

**10-526-208 DMS-OB/GYN SONOGRAPHY 1** ...prepares learners to perform ultrasounds of the nonpregnant uterus and the first-trimester pregnancy. Explores the anatomy, physiology, and pathology of the female reproductive system as well as intrauterine and ectopic pregnancies. (Prerequisites: 10-524-204, DMS-Intro to DMS; 10-526-205, DMS-Patient Care & Ethics; 10-501-101, Medical Terminology; 10-806-177, Gen Anatomy & Physiology; Corequisite: 10-806-179, Adv Anatomy & Physiology)

**10-526-209 DMS-DMS CLINICAL 1** ...opportunities to apply scanning skills in a clinical setting. Students concentrate on ultrasound examinations of the abdominal organs. Participation in this course will take place at a hospital or clinic. (Prerequisites: 10-526-206, DMS-Sono Physics & Instrument; 10-526-207, DMS-Abdominal Sonography; 10-526-208, DMS-OB/GYN Sonography 1)

**10-526-210 DMS-CROSS SECTIONAL ANATOMY** ...introduces cross sectional anatomy as related to Diagnostic Medical Sonography. Includes correlating images from other imaging modalities. (Prerequisite: Accepted into the Diagnostic Medical Sonography Program.)

**10-526-211 DMS-SONOGRAPHY OF SUPERFICIAL STRUCTURES** ...investigates superficial structure imaging. Includes anatomy, pathophysiology, and sonographic evaluation. Prepared learner to perform ultrasounds of the thyroid, breast, male reproductive system, musculoskeletal system, and GI tract. (Prerequisites: 10-526-207, DMS-Abdominal Sonography; 10-526-206, DMS-Sono Physics & Instrument; 10-526-210, DMS-Cross Sectional Anatomy)

**10-526-212 DMS-OB/GYN SONOGRAPHY 2** ...prepares learners to perform ultrasounds of the second and third-trimester pregnancy. Explores the anatomy, physiology, and pathology of the female pelvis and the developing fetus. (Prerequisite: 10-526-208, DMS-OB/GYN Sonography 1)

**10-526-213 DMS-DMS CLINICAL 2** ...further experience in a clinical setting allows the student to continue to improve technical skills while accepting more responsibilities during scanning procedures. (Corequisite: 10-526-209, DMS-DMS Clinical 1)

**10-526-214 DMS-INTRO TO CARDIAC AND VASCULAR** ...introduces the uses of cardiac and vascular sonography. Explores the differences from the general concentration of ultrasound. Learners outline the components of cardiac and vascular exams and learn to correlate results with other diagnostic procedures. (Prerequisite: Accepted into the Diagnostic Medical Sonography Program)

**10-526-215 DMS-DMS CLINICAL 3** ...provides further opportunity for students to expand their skills in a clinical setting. Students begin to function as team members under the guidance of the instructor and authorized clinical personnel. (Prerequisite: 10-526-213, DMS-DMS Clinical 2)

**10-526-216 DMS-DMS CLINICAL 4** ...prepares the student to assume the role of a Sonographer. This course enhances the student's scanning and employee skills through clinical practice. Serves as a transition between student and employee. (Corequisite: 10-526-215, DMS-DMS Clinical 3)

**10-526-217 DMS-REGISTRY REVIEW** ...prepares students to take the ARDMS examinations. Provides a review of the Diagnostic Medical Sonography competencies. (Corequisite: 10-526-216, DMS-DMS Clinical 4)

**10-526-220 DMS-SCANNING WITH PROFICIENCY** ...provides learners with the opportunity to enhance their technical skills, accuracy, and proficiency in scanning the abdominal organs and female pelvis of the human body. This is a scanning course dedicated in continuing to prepare the learner for their first clinical experience. (Prerequisites: 10-526-207, DMS-Abdominal Sonography; 10-526-208, DMS-OB/GYN Sonography 1)

# Diesel and Heavy Equipment Technician

Program Code 324121

## Technical Diploma

Offered at the Sturgeon Bay campus.

For information: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Prepares students to service and repair diesel powered equipment. Instruction covers repair of engine, engine systems driveline, steering, brakes, hydraulic systems, and chassis components.

### Program Outcomes

- Apply hydraulic systems fundamentals.
- Manage chassis, steering, and suspension systems.
- Explain diesel engine systems.
- Explain diesel engine fundamentals.
- Describe the mechanics of track drive systems.
- Perform required preventative maintenance.
- Use welding and machine tools.
- Maintain brake systems.
- Analyze electronic/electrical systems.
- Manage heating - AC systems.
- Interpret schematic drawings.
- Comprehend power train systems.
- Diagnose engine systems.
- Service vehicle systems.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of Basic Math, see the Basic Education section of this catalog.

### Accreditation

The NWTC Diesel and Heavy Equipment Technician program is ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards. Additionally, all instructional staff in the NWTC Diesel and Heavy Equipment Programs are, at a minimum, Master, ASE Certified Technicians.

The NWTC Diesel Equipment Technology program is an AED Foundation (Associated Equipment Dealers) Certified Program.

### Employment Potential

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

**Construction Equipment Technician:** diagnoses, services, and repairs a variety of construction equipment such as track type tractors, wheel loaders, and back hoe loaders.

**Engine Technician:** diagnoses and repairs diesel engines.

**Farm Equipment Technician:** diagnoses, services, and repairs a variety of diesel-powered agricultural equipment.

**Fuel Injection Technician:** diagnoses, services, and repairs fuel injection systems.

**Service Technician:** performs preventive maintenance and regularly scheduled maintenance on equipment to keep it in service.

**Truck Driver/Diesel Technician:** owns or operates a small fleet and wants to perform his/her own regular and preventive maintenance.

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

- Diesel Equipment Mechanic Instructor
- Diesel Shop Owner
- Sales Representative
- Shop Supervisor
- Technical Service Representative
- Truck Fleet Operator

### Note

- Diesel program students are able to enroll in a four credit Power Generation program enhancement certificate. Please call (920) 746-4919 for more details.
- Diesel program students have the opportunity to obtain an A, B or C class Commercial Drivers' License (CDL). Please call (920) 746-4916 for more details.

### Curriculum

The Diesel and Heavy Equipment Technician Technical Diploma is a two-year, four-semester program offered at the Sturgeon Bay campus. Upon graduation, a student will have completed 64 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-111	Micro: Windows-Intro	1
10-412-100	Diesel Lab Operations Tech	1
10-412-108	Inte Combust Eng Tech-Intro to	1
10-412-109	Diesel Engine Service-Fundamen	5
10-412-112	Diesel Electrical Systems 1 Te	3
10-602-118	DC Electricity Technology	1
10-804-106	Intro to College Math	3
32-442-352	Welding-Metal Working Proc	2
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-412-120	Diesel-Chassis/Susp/Steer Tech	4
10-412-121	Diesel-Brake Systems Technolog	3
10-412-122	Diesel Preventive Maint Techno	4
10-412-123	Diesel-Elect Systems Technolog	3
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>15</b>

#### Third Semester

10-412-124	Diesel-Electric Eng System Tec	1
10-412-134	Diesel Engine Systems Technolo	4
10-412-136	Diesel-Mobile Hydraulic Sys Te	2
10-412-137	Diesel-Schematic Interpret Tec	2
10-412-138	Diesel-Track Drive Systems Tec	2
10-412-142	Diesel Equip Service/Maint Tec	3
10-419-169	Hydraulics Technology	2
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-412-140	Diesel Engine Troubleshoot Tec	4
10-412-141	Diesel-Power Trains Technology	5
10-412-145	Diesel-Refrig/AC Technology	3
10-809-197	Contemporary Amer Society	3
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>64</b>

This program is fully eligible for financial aid.



### 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](http://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.*

#### 10-412-100 DIESEL LAB OPERATIONS TECHNOLOGY

...diesel shop safety, basic equipment operation, rigging and lifting, hand and power precision tools, fasteners and hazard material handling procedures.

#### 10-412-108 INTERNAL COMBUSTION ENGINE

**TECHNOLOGY - INTRO TO** ...basic internal combustion (IC) engine types, IC engine classifications and applications, IC engine theory and operation, IC engine construction and careers in IC engine service and repair.

#### 10-412-109 DIESEL ENGINE SERVICE TECHNOLOGY-

**FUNDAMENTALS** ...diesel engine service procedures; lubrication, cooling, fuel intake and exhaust systems, bearings, seals and basic diesel engine diagnosis.

#### 10-412-112 DIESEL ELECTRICAL SYSTEMS 1

**TECHNOLOGY** ...will cover but not be limited to: electronic components, electrical safety, storage batteries, charging and starting systems. Knowledge, skills and understanding required for employment in the diesel field.

#### 10-412-120 DIESEL-CHASSIS/SUSP/STEER TECHNOLOGY

...vehicular steering systems, heavy-duty axles, suspension systems, wheels and tires, coupling systems. (Corequisite: 10-412-100, Diesel-Lab Operations Tech)

#### 10-412-121 DIESEL-BRAKE SYSTEMS TECHNOLOGY

...braking systems, drum brake principles, disc brakes, foundation brake systems, air brakes, anti-lock systems. (Corequisite: 10-412-100, Diesel Lab Operations Tech)

#### 10-412-122 DIESEL PREVENTIVE MAINT TECHNOLOGY

...safety terms, maintenance, inspection, lubricants, clutch, brakes, wheels and rims, steering, suspension, electrical, air system, and hydraulic system. (Corequisite: 10-412-100, Diesel Lab Operations Tech)

#### 10-412-123 DIESEL-ELECT SYSTEMS TECHNOLOGY

...will cover but not be limited to: electronic components, electrical safety, storage batteries, charging and starting systems. Knowledge, skills and understanding required for employment in the diesel field. (Prerequisite: 10-412-112, Diesel Electrical Systems 1 Tech)

#### 10-412-124 DIESEL-ELECTRIC ENG SYSTEM

**TECHNOLOGY** ...engine, drive train, chassis, and cab computer systems software.

#### 10-412-134 DIESEL ENGINE SYSTEMS TECHNOLOGY

...shop safety, fuel system components, governors, nozzles, American Bosch systems, Robert Bosch systems, Lucas systems, Stanadyne systems, Cummins systems, Detroit Diesel systems, Caterpillar systems, and testing methods. (Prerequisite: 10-412-109, Diesel Engine Ser Fund Tech)

#### 10-412-136 DIESEL-MOBILE HYDRAULIC SYSTEM

**TECHNOLOGY** ...mobile hydraulics system components safety, principles of operation, diagnosis, and service.

#### 10-412-137 DIESEL-SCHEMATIC INTERPRET

**TECHNOLOGY** ...electronic/hydraulic schematics, applications of schematics, system similarities, components, review of systems operation, practical applications in diagnosing system problems, use of special test equipment/schematics to solve problems. (Prerequisite: 10-412-123, Diesel Electrical Systems Tech II)

#### 10-412-138 DIESEL-TRACK DRIVE SYSTEMS

**TECHNOLOGY** ...track shop safety, track drive component parts, system operation, inspection, system diagnoses, system repair, system service, and system maintenance. (Corequisite: 10-412-100, Diesel-Lab Operations)

#### 10-412-140 DIESEL ENGINE TROUBLESHOOT

**TECHNOLOGY** ...diesel engine troubleshooting steps, major check points when inspecting or operating a diesel engine, causes of poor engine performance and failure, perform engine diagnostic tests, dyno test an engine. (Prerequisite: 10-412-109, Diesel Engine Ser Fund Tech)

#### 10-412-141 DIESEL-POWER TRAINS TECHNOLOGY

...safety, power train components, coupling systems, hydraulic retarders, mechanical transmissions, drive shafts, final drives, gear reduction boxes, planetary gear sets, chain-type final drive, belt drive systems.

#### 10-412-142 DIESEL EQUIP SERVICE/MAINT TECHNOLOGY

...shop safety; service manuals; preventive maintenance forms; federal inspection policy; preventive maintenance for trucks, trailers, engine brakes/retarders, construction, and agricultural equipment; and electronic trouble shooting trees. (Corequisite: 10-412-100, Diesel Lab Operations Tech)

#### 10-412-145 DIESEL-REFRIG/AC TECHNOLOGY

...safety; basics of air conditioning; refrigerants and oil; basic system and its functions; environmental safety practices; inspection, diagnosing, and using service tools. (Corequisite: 10-412-100, Diesel-Lab Operations Tech)

**10-419-169 HYDRAULICS TECHNOLOGY** ...will cover the following but not be limited to hydraulics principles, system schematics and symbols, pumps, valves, cylinders, motors, accumulators, filters, reservoirs, hydraulic seals, fluids, maintenance, and safety rules.

**10-602-118 DC ELECTRICITY TECHNOLOGY**...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism, \*research paper comparing and contrasting A/C and D/C electrical applications.



# Diesel Equipment Technology

Program Code 104121

## Associate Degree

Offered at the Sturgeon Bay campus.

For information: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Prepares students to service and repair diesel powered equipment and prepare graduates for management, ownership, supervisory level positions and advanced educational options. Instruction incorporates repair of steering, brakes, hydraulic systems, and chassis components.

### Program Outcomes

- Apply hydraulic systems fundamentals.
- Manage chassis, steering, and suspension systems.
- Explain diesel engine systems.
- Explain diesel engine fundamentals.
- Perform required preventive maintenance.
- Maintain brake systems.
- Analyze electronic/electrical systems.
- Manage heating - A/C systems.
- Comprehend power train systems.
- Interpret schematic drawings.
- Diagnose engine systems.
- Service vehicle systems.
- Communicate effectively with the customer.
- Complete customer repair orders accurately.
- Organize a daily work schedule.
- Tabulate a daily time sheet of technician's repair work.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in math, science and technology education would be beneficial.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Accreditation

The NWTC Diesel and Heavy Equipment Technician program is ASE Certified to NATEF (National Automotive Technicians Education Foundation) Standards. Additionally, all instructional staff in the NWTC Diesel and Heavy Equipment Programs are, at a minimum, Master, ASE Certified Technicians.

The NWTC Diesel Equipment Technology program is an AED Foundation (Associated Equipment Dealers) Certified Program.

### Employment Potential

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

**Diesel and Heavy Equipment Technician:** diagnoses, services, and repairs a variety of heavy equipment ranging from over-the-road trucks, off-road construction equipment, agricultural equipment, and potentially stationary power supply engines.

**Related Specialist Technician:** diagnoses, services, and repairs fuel injection systems, hydraulics systems, trailer service and other specialty areas.

**Related Parts Support Manager:** manages a parts department within a repair facility.

**Industry Related Service Manager-Supervisor:** manages technician performance, directs work flow, tracks work progress, coordinates service business profitability, reports to operations level management.

**Industry Related Sales Representative:** sales position within the diesel and heavy equipment industry or support business to the industry.

**Business Owner:** owns own business related to the diesel and heavy equipment or support business.

**Educational Trainer:** with additional study and transfer to a four-year baccalaureate college, a graduate could pursue a four-year degree in secondary, post-secondary or technical training industry.

### Note

- A three to five page paper or specialty assignments are required for courses applied to an associate degree. Individual instructor requirements will be received at program orientation and listed in each course syllabus.
- Diesel program students are able to enroll in a four credit Power Generation program enhancement certificate. Please call (920) 746-4919 for more details.
- Diesel program students have the opportunity to obtain an A, B or C class Commercial Drivers' License (CDL). Please call (920) 746-4916 for more details.

### Curriculum

The Diesel Equipment Technology Associate Degree is a two-year, four-semester program offered at the Sturgeon Bay campus. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-412-100	Diesel Lab Operations Tech	1
10-412-108	Inte Combust Eng Tech-Intro to	1
10-412-109	Diesel Engine Service-Fundamen	5
10-412-112	Diesel Electrical Systems 1 Te	3
10-602-118	DC Electricity Technology	1
10-801-195	Written Communication	3
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-412-120	Diesel-Chassis/Susp/Steer Tech	4
10-412-121	Diesel-Brake Systems Technolog	3
10-412-122	Diesel Preventive Maint Techno	4
10-412-123	Diesel-Elect Systems Technolog	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-412-124	Diesel-Electric Eng System Tec	1
10-412-134	Diesel Engine Systems Technolo	4
10-412-137	Diesel-Schematic Interpret Tec	2
10-419-169	Hydraulics Technology	2
10-809-172	Race Ethnic & Diversity	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>15</b>

#### Fourth Semester

10-412-140	Diesel Engine Troubleshoot Tec	4
10-412-141	Diesel-Power Trains Technology	5
10-412-145	Diesel-Refrig/AC Technology	3
10-801-197	Technical Reporting	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>67</b>

This program is fully eligible for financial aid.





### 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](http://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.*

#### 10-412-100 DIESEL LAB OPERATIONS TECHNOLOGY

...diesel shop safety, basic equipment operation, rigging and lifting, hand and power precision tools, fasteners and hazard material handling procedures.

#### 10-412-108 INTERNAL COMBUSTION ENGINE

**TECHNOLOGY - INTRO TO** ...basic internal combustion (IC) engine types, IC engine classifications and applications, IC engine theory and operation, IC engine construction and careers in IC engine service and repair.

#### 10-412-109 DIESEL ENGINE SERVICE TECHNOLOGY-

**FUNDAMENTALS** ...diesel engine service procedures; lubrication, cooling, fuel intake and exhaust systems, bearings, seals and basic diesel engine diagnosis.

#### 10-412-112 DIESEL ELECTRICAL SYSTEMS 1

**TECHNOLOGY** ...will cover but not be limited to: electronic components, electrical safety, storage batteries, charging and starting systems. Knowledge, skills and understanding required for employment in the diesel field.

#### 10-412-120 DIESEL-CHASSIS/SUSP/STEER TECHNOLOGY

...vehicular steering systems, heavy-duty axles, suspension systems, wheels and tires, coupling systems. (Corequisite: 10-412-100, Diesel-Lab Operations Tech)

#### 10-412-121 DIESEL-BRAKE SYSTEMS TECHNOLOGY

...braking systems, drum brake principles, disc brakes, foundation brake systems, air brakes, anti-lock systems. (Corequisite: 10-412-100, Diesel Lab Operations Tech)

#### 10-412-122 DIESEL PREVENTIVE MAINT TECHNOLOGY

...safety terms, maintenance, inspection, lubricants, clutch, brakes, wheels and rims, steering, suspension, electrical, air system, and hydraulic system. (Corequisite: 10-412-100, Diesel Lab Operations Tech)

#### 10-412-123 DIESEL-ELECT SYSTEMS TECHNOLOGY

...will cover but not be limited to: electronic components, electrical safety, storage batteries, charging and starting systems. Knowledge, skills and understanding required for employment in the diesel field. (Prerequisite: 10-412-112, Diesel Electrical Systems 1 Tech)

#### 10-412-124 DIESEL-ELECTRIC ENG SYSTEM

**TECHNOLOGY** ...engine, drive train, chassis, and cab computer systems software.

#### 10-412-134 DIESEL ENGINE SYSTEMS TECHNOLOGY

...shop safety, fuel system components, governors, nozzles, American Bosch systems, Robert Bosch systems, Lucas systems, Stanadyne systems, Cummins systems, Detroit Diesel systems, Caterpillar systems, and testing methods. (Prerequisite: 10-412-109, Diesel Engine Ser Fund Tech)

#### 10-412-137 DIESEL-SCHEMATIC INTERPRET

**TECHNOLOGY** ...electronic/hydraulic schematics, applications of schematics, system similarities, components, review of systems operation, practical applications in diagnosing system problems, use of special test equipment/schematics to solve problems. (Prerequisite: 10-412-123, Diesel Electrical Systems Tech II)

#### 10-412-140 DIESEL ENGINE TROUBLESHOOT

**TECHNOLOGY** ...diesel engine troubleshooting steps, major check points when inspecting or operating a diesel engine, causes of poor engine performance and failure, perform engine diagnostic tests, dyno test an engine. (Prerequisite: 10-412-109, Diesel Engine Ser Fund Tech)

#### 10-412-141 DIESEL-POWER TRAINS TECHNOLOGY

...safety, power train components, coupling systems, hydraulic retarders, mechanical transmissions, drive shafts, final drives, gear reduction boxes, planetary gear sets, chain-type final drive, belt drive systems.

#### 10-412-145 DIESEL-REFRIG/AC TECHNOLOGY

...safety; basics of air conditioning; refrigerants and oil; basic system and its functions; environmental safety practices; inspection, diagnosing, and using service tools. (Corequisite: 10-412-100, Diesel-Lab Operations Tech)

#### 10-419-169 HYDRAULICS TECHNOLOGY

...will cover the following but not be limited to hydraulics principles, system schematics and symbols, pumps, valves, cylinders, motors, accumulators, filters, reservoirs, hydraulic seals, fluids, maintenance, and safety rules.

#### 10-602-118 DC ELECTRICITY TECHNOLOGY

...ohms, amps, voltage, wire repair, series and parallel circuits, meter use, magnetism, \*research paper comparing and contrasting A/C and D/C electrical applications.

# Digital Media Technology

Program Code 102065

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Digital Media Technology Program prepares students to compete in a global digital workforce including content conception, creation, and implementation. Learners will develop multimedia production skills using digital audio and video recording and editing, digital photography, animation, internet broadcasting (i.e., podcasting), and data transfer and conversion from analog to digital media. The program will provide learning opportunities for those desiring a business-related position or project-based entrepreneurial contract work.

### Program Outcomes

- Create design for digital media.
- Perform internet broadcasting.
- Assemble a digital media portfolio.
- Produce animation for video.
- Create professional digital photography images.
- Create interactive digital interfaces.
- Operate digital media studio.
- Interface digital media into web sites.
- Set the motion effects to 2D graphic designs.
- Write scripts.
- Conduct multi-track recording sessions.
- Compose audio scoring for video.
- Conduct live audio recording for video.
- Compose/edit/image both still and motion photography.
- Model/record/animate images.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Computer familiarity and ability to use a keyboard and mouse.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of the College Catalog.

### Note

- Graphic Workstations class is a co-requisite to any first semester course in the Digital Media Technology degree. It is also suggested that learners, regardless of age or professional experience, should take the Graphic Workstations class if they are not familiar with the Macintosh OSX version operating system. This course is designed to help familiarize the learner with the Macintosh computer environment used in the Digital Media Technology degree.
- Students who complete this program are eligible to receive the Multimedia Technologies Certificate.

### Employment Potential

Program graduates may work in this evolving Digital Media Technology field, and will be needed by the media industry, as designers, developers, and technicians. For example, they will be hired or contracted as media creators and designers for video, interactive media, games, websites, and some will be New Media entrepreneurs expanding applications for the media arts in the 21st century.

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

**Digital Media Operators:** develops multi-functional digital content for commercial, educational, and entertainment establishments. Research and analyzes digital media utilization and functionality. Reviews digital media trends and effectiveness in marketing, advertising, training, creative services, and communications fields.

**Motion Graphic Artist:** performs detailed graphic compositing for broadcast, web, DVDs and mobile devices. Coordinates production of animated visuals and presentations for business, training, recreational and other applications.

**Video Editor:** assists post-production department by performing asset management and non-linear video editing duties. Performs script-based synchronization of audio, video, special effects, titles and graphics.

**Multimedia Production Assistant:** assists in production, from concept through postproduction, of digital media client-based projects. Operational workflow duties include assisting with concept planning, storyboarding, scriptwriting, production, editing, and delivery.

**Freelance Digital Media Producer:** initiates entrepreneurial work with self-established client base. Acts as a full-service digital media content creator and consultant. Provides customer with promotional, training, communication and other content for internal and external delivery methods and mediums.

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

- Digital Media Operations Manager
- Internet Broadcaster
- Sound Recordist/Editor
- Video Production Coordinator
- Videographer
- Video Department Manager

### Curriculum

The Digital Media Technology Associate Degree is a two-year, four-semester program. Learners are encouraged to meet with an NWTC Academic Advisor to create a program plan. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-111-101	Macintosh-Image Editing	3
10-111-103	Graphic Workstations	1
10-206-100	Digital Audio Overview	3
10-206-107	Internet Broadcasting	3
10-801-136	English Composition 1	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-111-159	Graphic Workstations-Adv	3
10-203-104	Photography-Digital	3
10-206-101	Soundtracks and Music	3
10-206-108	Internet Broadcasting-Advanced	3
10-206-154	Macintosh-Multimedia Authoring	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-203-180	Photography-Digital Workflow	3
10-206-109	Digital Studio Operations	3
10-206-125	DVD Authoring	3
10-809-103	Think Critically & Creatively	3
10-809-172	Race Ethnic & Diversity	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-206-104	Digital Media Trends/Business	3
10-206-105	Digital Media Tech Internship	3
OR		
10-206-106	Digital Media Freelance	3
10-206-174	Motion Graphics for Video	3
10-809-195	Economics	3
	Elective	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>67</b>

#### Suggested Electives:

Macintosh Image Editing – Advanced, 10-111-110  
Video Photography, 10-206-183  
Video Animation, 10-206-173

This program is fully eligible for financial aid.

## 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](http://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.*

### 10-111-101 MACINTOSH-IMAGE EDITING

...(Adobe Photoshop + Adobe Acrobat) scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print. An introduction to manipulating bitmap images. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-103 GRAPHIC WORKSTATIONS** ...explore the Macintosh Operating System and applications including iPhoto, iTunes, iMovie, GarageBand, FontBook, Sherlock, iCal, AddressBook and Dashboard. Learn to navigate the Mac Operating System and manage files and folders.

### 10-111-159 GRAPHIC WORKSTATIONS-ADVANCED

...operation of production systems, applications used in graphic design/multimedia industries; OSX (Ten) operating system, directory structure, file management, application operation; cross platform file usage/delivery. (Prerequisite: 10-111-103, Graphic Workstations)

**10-203-104 PHOTOGRAPHY-DIGITAL** ...capturing digital images, exposure, shutter speed, aperture, composition, camera operations, lenses, lighting, camera accessories, types of photography, photo challenges, importing, editing and storing images. Access to a digital camera required.

### 10-203-180 PHOTOGRAPHY-DIGITAL WORKFLOW

...(Apple Aperture) photo editing, image retouching, proofing, publishing, archiving. Techniques for sorting, ranking, organizing images, display images for client review, apply metadata, keep up-to-date online portfolio, color manage your workflow.

**10-206-100 DIGITAL AUDIO OVERVIEW** ...concept of analog to audio conversion, processing sound in digital domain, MIDI music production, CD audio production, video soundtracks, enhanced podcast audio, basic of time code and format conversion.

**10-206-101 SOUNDTRACKS AND MUSIC** ...software applications for sampling, synthesizing, analog to digital conversion, mixing and mastering for MP3's, RSS feeds, podcasts, CD's and video soundtracks.

**10-206-104 DIGITAL MEDIA TRENDS IN BUSINESS** ...research, present analysis of, industry usage of current/emerging digital media technologies including implementation, usage, delivery. Plan, organize, include new digital media concepts and strategies in business plans and operation.

**10-206-105 DIGITAL MEDIA TECHNOLOGY INTERNSHIP** ...hands-on experience in a digital media production for business concluding with an evaluation by employer/instructor. Apply concepts, skills and techniques. Course should be taken during the final semester.

**10-206-106 DIGITAL MEDIA FREELANCE PROJECT** ...classroom experience with entrepreneurial contract-based projects. Develop commercially viable video, audio, photographic projects per client's specifications and requirements. Course should be taken during final semester.

**10-206-107 INTERNET BROADCASTING** ...plan, prepare and organize digital media content for online distribution and access. Pre-through post-production techniques including technical and commercial aspects of digital media content for internet delivery.

**10-206-108 INTERNET BROADCASTING-ADVANCED** ...advanced pre- through post-production techniques including technical/commercial aspects of digital media content for internet delivery. Business fundamentals, target marketing, copy writing, commercial distribution, user-generated content (UGC) service/s. (Prerequisite: 10-206-107, Internet Broadcasting)

**10-206-109 DIGITAL STUDIO OPERATIONS** ...research, implement, maintain workflow/equipment used in a modern digital media studio. Prepare functioning environment for audio, video, photography production including capture, editing, delivery, archiving.

**10-206-125 DVD AUTHORIZING (DVD Studio Pro)** ...setup and create interactive DVD productions. Other topics covered include: Bit-Budgeting, Storyboarding, Video and Audio Encoding, Menu Creation, and Delivery.

**10-206-154 MACINTOSH-MULTIMEDIA AUTHORIZING** ...media types including audio, video and graphics to create original commercial, educational and entertainment productions for delivery to broadcast, CD/DVD and web. Final Cut Pro, LiveType and Photoshop software. (Prerequisites: 10-111-101, Macintosh-Image Editing)

**10-206-174 MOTION GRAPHICS FOR VIDEO** ...creating high impact, dynamic effects for video productions utilizing digital media including still and motion video, graphics, text and applied filters. Apple Motion, Adobe After Effects and Photoshop software. (Prerequisites: 10-206-154, Multimedia Authoring; 10-111-101, Mac Image Editing; 10-111-103, Graphic Workstations)



# E-Business Technology Specialist

Program Code 101353

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The E-Business Technology Specialist program prepares students to integrate web technologies to support internet-based business systems and websites using concepts in design, programming and/or marketing.

After admission, each learner is required to complete a program planner indicating tracks selected and outlining a tentative course completion timeline. This plan will be reviewed and approved by an instructor before enrolling in courses.

### Program Outcomes

- Communicate effectively.
- State and solve technical problems.
- Interact within society.
- Demonstrate an understanding of business models and organizational functions necessary to conduct business in a changing environment.
- Effectively apply business math models when analyzing and solving problems.

Graduates selecting the **Web Marketing Strategy** track will also be able to:

- Understand the business models underlying electronic business.
- Effectively research business and consumer markets to create web-based marketing strategies.
- Understand the relevancy and importance of search engines to a web-based business.
- Develop a web-based business plan.

Graduates selecting the **Website Design** track will also be able to:

- Produce effective websites with interactive web graphics and animation.
- Ensure cross-platform and cross-browser website usability.
- Create functional and efficient website navigation.

Graduates selecting the **Web Application Programming** track will also be able to:

- Develop, build, and configure a dynamic and interactive website or application.
- Create a database design and effective interface to support a web application.
- Understand the infrastructure required to support a robust website or application.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- One year of high school algebra or equivalency.
- Computer familiarity and ability to use a keyboard and mouse.

### Employment Potential

Program graduates may work in a variety of areas of an organization depending upon their selection of course tracks. A graduate of the program will have the potential for employment as a:

**Web Developer:** designs, implements, and maintains intranet and internet web applications/sites.

**E-Business Developer/E-Business Specialist:** creates business strategies and plans for providing web-based business-to-business or business-to-consumer support and service.

**Web Technical Support:** develops and maintains internal system support processes and coordinates the integration of the web with other computer systems.

**Web Analyst/E-Business Analyst:** track and analyze key business metrics related to web activities.

**Consultant:** work with clients to improve the efficiency and effectiveness of the e-business infrastructure.

Some positions may require additional education and/or work experience.

### Note

If a student completes a track in this program, they are eligible to receive the certificate of the same title.

**Learners select *two* of the following course tracks:** Web Marketing Strategy; Website Design; and/or Web Application Programming

Students taking the **Web Marketing Strategy** track will be required to take Marketing Principles, 10-104-110.

Students taking the **Website Design** track should have a working knowledge of Macintosh computers and/or graphic software.

### Curriculum

The E-Business Technology Specialist Associate Degree is a flexible degree program consisting of a common curriculum of general education and business support courses. **The learner is required to select two tracks of occupational courses.** Learners are required to meet with a counselor and create a program plan, which will be sent to the Business and Information Technology Division. Upon graduation, a student will have completed 66 credits.

### All Students Must Complete

Catalog No.	Description	Credits
10-101-106	Accounting-for Non-Accountants	3
10-102-158	Business-Intro	3
OR		
10-104-110	Marketing Principles	3
10-135-100	E-Business Tech Internship	3
OR		
10-135-101	E-Business Tech Field Study	3
10-135-118	E-Business Principles	3
10-152-185	Website Coding	3
10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Comm	3
10-804-123	Math w Business Apps	3
OR		
10-804-133	Math & Logic	3
10-809-103	Think Critically & Creatively	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-199	Psychology Of Human Relations	3
	<b>Credits</b>	<b>36</b>

### WEB MARKETING STRATEGY

10-104-119	E-Business Web Marketing	3
10-135-112	E-Business Implement Plan	3
10-135-115	E-Business Online Search	3
10-135-116	E-Business Database Mktg	3
10-182-130	E-Business Logistics/Fulfill	3
OR		
10-196-188	Project Management	3
	<b>Credits for Web Marketing Strategy</b>	<b>15</b>

### WEBSITE DESIGN

10-111-101	Macintosh-Image Editing	3
10-111-150	Web Graphic Design	3
10-135-151	Website Design	3
10-135-152	Web Animation Design	3
10-135-172	Web Animation Design Adv	3
	<b>Credits for Website Design</b>	<b>15</b>

### WEB APPLICATION PROGRAMMING

10-150-144	IT:Network:Operating Sys Fund	3
10-152-180	IT:Web:Client Script-Javascript	3
10-152-182	IT:Web:Svr Side Script-PHP	3
OR		
10-152-183	IT:Web:Svr Side Script-ASP:Net	3
10-152-184	IT:Web:Programming-SQL	3
10-154-125	IT:Web:Database Development	3
	<b>Credits for Web Application Programming</b>	<b>15</b>
	<b>Total Credits</b>	<b>66</b>

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-101-106 ACCOUNTING: INTRO FOR NON-ACCOUNTANTS

...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-104-110 MARKETING PRINCIPLES** ...marketing management, market segmentation, market research, consumer behavior, product decisions and management of distribution, pricing, promotional decisions for strategy planning.

### 10-104-119 E-BUSINESS WEB MARKETING

...traditional and electronic direct marketing strategies; methods include search engine management, direct marketing planning, database marketing, catalogs, telemarketing services, print, radio, television and direct mailing. (Prerequisite: 10-104-110, Marketing Principles)

**10-111-101 MACINTOSH-IMAGE EDITING** ...(Adobe Photoshop + Adobe Acrobat) scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print. An introduction to manipulating bitmap images. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-150 WEB GRAPHIC DESIGN** ...(Adobe Photoshop) design and prepare graphics for the web including graphics for backgrounds, rollover effects, navigation, and badges. Also includes techniques for optimization and transparency. (Prerequisites: 10-111-101, Macintosh Image Editing; 10-152-185, Website Coding)

**10-135-100 E-BUSINESS TECHNOLOGY INTERNSHIP** ...individual on-the-job training: consulting with users in design, development, and implementation of web technologies and internet-based business systems. Course should be taken during the last semester.

**10-135-101 E-BUSINESS TECHNOLOGY FIELD STUDY** ...alternative to the internship: in-depth study of a business(es) involved in design, development, and implementation of web technologies and internet-based business systems. Course should be taken during the last semester.

### 10-135-112 E-BUSINESS IMPLEMENTATION PLAN

...implementation plan for a web-based business including analysis of: market need, product development, operational planning, competitive analysis, financial need forecasting, and risk assessment.

### 10-135-115 E-BUSINESS ONLINE SEARCH STRATEGIES

...understanding of how search engines relate to the success of a website or web-based business by investigating the primary search engines and the tactics that can be used to increase visibility within search engines.

### 10-135-116 E-BUSINESS DATABASE MARKETING

...applications of database marketing are identified and evaluated. Create relational database structures, utilize databases to initiate marketing programs, create valuable output, and process and analyze extracted data.

**10-135-118 E-BUSINESS PRINCIPLES** ...how the Internet and the Web dramatically impact consumers and organizations carry out the marketing function.

**10-135-151 WEBSITE DESIGN** ...(Adobe Dreamweaver) use standards based XHTML and CSS to design, develop and deploy websites; including: browser compatibility, FTP, forms, multi-media, RSS, and site management. (Prerequisite: 10-111-150 Web Graphic Design )

**10-135-152 WEB ANIMATION DESIGN** ...(Adobe Flash) vector animation, create, import source material, incorporate into flash movies, use Stage and Timeline, motion, shape-tweening, add sound to buttons, use Action Script, and test flash.

### 10-135-172 WEB ANIMATION DESIGN-ADVANCED

...(Adobe Flash) use object-based animations to modify motion paths, control individual attributes, create kinematic effects, transform 2D objects to 3D. Includes procedural modeling, metadata support, motion presets, and encoding. (Prerequisite: 10-135-152, Web Animation Design)

**10-150-144 IT:NETWORK:OPERATING SYSTEM FUNDAMENTALS** ...installation of Windows client, Windows Server and Linux Server operating systems. Basic networking topologies and protocol fundamentals. Application installation including Simple Mail Transport Protocol, File Transfer Protocol, and Web server technologies.

### 10-152-180 IT:WEB:CLIENT SCRIPT-JAVASCRIPT

...integrate Javascript into interactive HTML pages, create user-defined functions, complete form validation, use objects within the Document Object Model, manipulate cookies, create image rollovers, debug code, and test browser compatibility. (Prerequisite: 10-152-185, Website Coding)

**10-152-182 IT:WEB:SERVER SIDE SCRIPTING-PHP** ...use PHP, MySQL, XHTML, CSS and Apache to create standards based websites. PHP is used to connect to a MySQL database and retrieve site content. PHP is also used to organize the XHTML. (Prerequisites: 10-154-125, IT:Web:Database Development; 10-152-180, IT:Web:Client Script-Javascript)

**10-152-183 IT:WEB:SERVER SIDE SCRIPTING-ASP.NET** ...build interactive, database-driven websites with ASP.NET and C# with Visual Studio, handling web form events, using ASP.NET controls, designing master pages, managing state, and interacting with databases with ASP.NET data-bound controls. (Prerequisites: 10-154-125, IT:Web:Database Development; 10-152-180, IT:Web:Client Script-Javascript)

**10-152-184 IT:WEB:PROGRAMMING-SQL** ...write queries in a relational database: creating tables, setting primary/foreign keys, populating tables, manipulating data and reporting. Explore join types, stored procedures, functions, and database administration SQL statements. (Prerequisite: 10-154-125, IT:Web:Database Development)

**10-152-185 WEBSITE CODING** ...write code for functionality and design of web page text, hyperlinks, images, tables, and forms using (X)HTML and CSS. Apply and validate coding standards. Test browser function and user accessibility.

**10-154-125 IT:WEB:DATABASE DEVELOPMENT** ...understand database uses, data models, relational database management systems, relational database design, normalizing data and creation and maintenance of tables.

**10-182-130 E-BUSINESS LOGISTICS/FULFILLMENT** ...understanding of how Supply Chain Management is related to E-Commerce, E-Business distribution, E-Procurement, legal and ethical issues, and E-Business logistics applications.

**10-196-188 PROJECT MANAGEMENT** ...the role of project management, developing a project proposal, use of relevant software, working with project teams, sequencing tasks, charting progress, dealing with variations, budgets and resources, implementation, and assessment.

# Early Childhood Education

Program Code 103071

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Early Childhood Education program prepares students for a professional career in early childhood education, including preschool, childcare, and exceptional education settings from birth to age eight. It is designed to provide students with the skills and knowledge necessary in the field of child development.

### Program Outcomes

These program outcomes are currently being reviewed and minor modifications may be made:

- Apply child development theory to practice.
- Cultivate relationships with children, family, and the community.
- Assess child growth and development.
- Use best practices in teaching and learning.
- Demonstrate professionalism.
- Integrate health, safety, and nutrition practices.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Demonstrated suitability to the early childhood profession as indicated by completion of a personal skills inventory.
- Demonstrated proficiency in basic skills through a course placement assessment.
- Proper immunizations and basic health check.
- High school grade average of "C" or above grade requirement.
- Completed an American Heart Association CPR course prior to program entry. Students are required to maintain a current CPR card on a two-year renewal cycle.
- Mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### Note

- A student who does not meet the requirements for program entry is required to consult an NWTC counselor about ways to make up any deficiencies through testing or course work.
- It is necessary to show good health as evidenced by a medical examination within three months prior to beginning practicum class.
- Students will be required to wear a NWTC issued name tag, provide their own transportation to assigned sites and cover any other expenses related to practicum experiences. Students may be expected to travel distances.

### Employment Potential

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

**Early Childhood Teacher in Preschool or Group Childcare Centers/Head Start Teacher:** plans and implements daily activities with concern for health, safety, and welfare for a designated group of children; supervises the assistant childcare teacher; administers instructional program to young children that promotes their physical, social, psychological, and intellectual development; and provides a flexible balance of active and quiet activities, individual and group activities, indoor and outdoor activities, free choice, guided activities and conduct developmental assessments.

**Family Childcare Provider/Teacher/Owner:** same functions as above only in a home setting.

**Early Childhood Program Director, Day Camp Director, Child Care Center Administrator, Child Care Center Manager:** The above positions may require responsibilities of one or more of the following items: responsible to the Board of Directors for day-to-day operations of entire school, including programming, facility, fiscal responsibilities, working knowledge of professional organizations for higher standards, providing customer service, and all human resource functions such as: hiring/firing, supervision, training, and evaluation of staff according to state requirements.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27.)

The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into early childhood programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to classroom placement at the discretion of the educational site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee classroom placement, or guarantee graduation within typical program timing.

### Availability:

Student Teaching hours will span between 6 a.m. – 6 p.m. with the majority of the hours occurring in the morning and afternoon.

### Curriculum

The Early Childhood Education Associate Degree is a two-year program. Upon graduation, a student will have completed 68 credits. Courses are offered online, accelerated, and blended, and may be taken in any order as long as prerequisites are met. Below is a suggested timeline.

#### First Semester

Catalog No.	Description	Credits
10-307-148	ECE: Foundations of ECE	3
10-307-151	ECE: Infant & Toddler Dev	3
10-307-167	ECE: Hlth Safety & Nutrition	3
** 10-307-174	ECE: Practicum 1	2
* 10-307-178	ECE: Art Music & Lang Arts	3
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-307-179	ECE: Child Development	3
10-307-188	ECE: Guiding Child Behavior	3
** 10-307-192	ECE: Practicum 2	3
* 10-307-194	ECE: Math Science & Soc St	3
10-809-188	Developmental Psychology	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-307-166	ECE: Curriculum Planning	3
10-307-187	ECE: Children w Diff Abilities	3
10-307-195	ECE: Family & Community Rel	3
** 10-307-197	ECE: Practicum 3	3
10-804-110	Elem Algebra w Apps	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-307-198	ECE: Admin an ECE Program	3
** 10-307-199	ECE: Practicum 4	3
10-801-196	Oral/Interpersonal Comm	3
10-809-195	Economics	3
	Elective	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>68</b>

\* Blended online class requires two/three Saturday visits to the Green Bay Campus.

\*\* Practicum courses require student teaching in the community, in addition to course work. NWTC Faculty arranges practicum settings for/with students. The required hours in the placement are as follows: Practicum 1: 80 hours, Practicums 2, 3 & 4: each 108 hours. It is recommended that students take one practicum per semester. Students are required to achieve a grade of "C" or higher in the practicum courses to continue in or graduate from this program.

Read more about Practicums online.

This program is fully eligible for financial aid.

## 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](http://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.*

### 10-307-148 ECE: FOUNDATIONS OF EARLY CHILDHOOD

...integrate strategies that support diversity and anti-bias perspectives; summarize early childhood education settings; identify components of a quality programs; summarize responsibilities of early childhood professionals; explore early childhood curriculum models.

### 10-307-151 ECE: INFANT/TODDLER DEVELOPMENT

...infant and toddler development in an early childhood education setting. Development of infants/toddlers; prenatal conditions and development; child development theories; heredity and the environment; culturally and developmentally appropriate environments.

### 10-307-166 ECE: CURRICULUM PLANNING

...curriculum planning in early childhood. Strategies that support diversity and anti-bias perspectives; critical role of play; developmentally appropriate environment; caregiving routines; promoting child development and learning; early childhood curriculum models. (Prerequisites: 10-307-194, ECE: Math, Science, Social Studies OR 10-307-178, ECE: Art, Music, Language Arts)

**10-307-167 ECE: HEALTH/SAFETY/NUTRITION** ...health, safety, and nutrition in early childhood settings. Anti-bias perspectives; governmental regulations and professional standards; safe, healthy, and nutritionally sound early childhood programs; child abuse/neglect mandates; SIDS risk reduction.

**10-307-174 ECE: PRACTICUM 1** ...learn/practice skills in a child care setting. Includes documenting behavior, exploring diversity, implement activities developed by the cooperating teacher, practicing caregiving routines, and positive professional and interpersonal skills.

### 10-307-178 ECE: ART/MUSIC/LANGUAGE ARTS

...beginning curriculum development in art, music, and language arts. Role of play; developmentally appropriate environment; promote child development; caregiving routines as curriculum; language, literature, and literacy activities, art/music, movement activities.

### 10-307-179 ECE: CHILD DEVELOPMENT

...child development in the early childhood education setting. Social, cultural, and economic influences on child development; child development theories; development of children age three-eight; child development research; heredity and environment.

### 10-307-187 ECE: CHILDREN WITH DIFFERING ABILITIES

...differing abilities in early childhood settings. Anti-bias perspectives, inclusion, ADA/IDEA, typical and exceptional development; physical, cognitive, health/medical, communication, and/or behavioral/emotional disorders; community and professional resources; IEP/IFSP, adapt curriculum, cultivate partnerships.

### 10-307-188 ECE: GUIDING CHILDRENS BEHAVIOR

...strategies to guide children's behavior in the early childhood setting. Anti-bias perspectives, guidance principles, factors affecting behavior, guidance strategies, individual needs, guidance philosophy.

### 10-307-192 ECE: PRACTICUM 2

...learn/practice skills in a child care setting. Growth/Development, support diversity, implement student developed activity plans, guidance strategies, professional behaviors, caregiving routines as curriculum, positive interpersonal skills with adults. (Prerequisite: 10-307-174, ECE: Practicum 1)

### 10-307-194 ECE: MATH/SCIENCE/SOCIAL STUDIES

...beginning curriculum development in math, science, social studies. Support diversity, role of play, developmentally appropriate environment, activity plans that promote learning, create appropriate math, science and social studies activities.

### 10-307-195 ECE: FAMILY/COMMUNITY RELATIONSHIPS

...relationships with family/community in early childhood. Diversity and anti-bias perspectives in families and community; family patterns, trends, relationships; communication strategies; relationships with families; advocate for children/families; community resources.

### 10-307-197 ECE: PRACTICUM 3

...learn/practice skills in a child care setting. Assess growth/development; early childhood standards; curriculum; developmentally appropriate environment; guidance strategies; professional behaviors/practices; lead caregiving routines; interpersonal skills with children/adults. (Prerequisite: 10-307-192, ECE: Practicum 2)

### 10-307-198 ECE: ADMINISTERING EARLY CHILDHOOD EDUCATION PROGRAM

...administration of an early childhood program. Diversity and anti-bias perspectives; ECE facilities, program, finances, aspects of personnel supervision, laws and regulations, advocacy.

### 10-307-199 ECE: PRACTICUM 4

...learn/practice skills in a child care setting. Growth/development, assessment, anti-bias perspectives, professional behavior/practices; curriculum, relationships, evaluating programs for quality, professional options in early childhood. (Prerequisite: 10-307-197, ECE: Practicum 3)



# Electrical Engineering Technology

Program Code 106621

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Electrical Engineering Technology (EET) prepares students to test, maintain, and troubleshoot electrical and electronic devices as found in machinery, computers, and communications. The program consists of two tracks: a transfer track, which includes calculus, for those students planning to transfer to a four-year EET program, and a general track, for those students not planning to transfer. The EET transfer track graduate will be able to transfer to a four-year bachelor's degree program in Electrical Engineering Technology.

### Program Outcomes

- Adhere to workplace safety standards.
- Communicate using common technical terminology and graphic symbology.
- Write a technical document.
- Develop an industry acceptable team centered work ethic.
- Use office suite software package tools.
- Solve problems using algebra, trig, complex numbers, logarithms, exponentials, and calculus.
- Relate mathematics to the field of electricity and electronics.
- Interpret graphical data.
- Measure electrical parameters in DC and wideband AC circuits.
- Apply circuit theorems to AC/DC RLC circuits.
- Apply theorems to basic digital circuits.
- Describe transfer characteristics of frequency sensitive linear circuits.
- Manipulate formulas describing electrical/electronic phenomena.
- Predict operation of circuits containing active components.
- Describe the various digital modulation techniques.
- Identify characteristics of power electrical devices and circuits.
- Describe the assembly and interconnections of a microprocessor system.
- Use computer assembly language to program microprocessors and interface circuits.
- Operate microprocessor interface circuits.
- Describe wireless analog communication techniques.
- Analyze automatic electrical machine control circuits.
- Use tools for electrical/electronic test and assembly tasks.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Electrical Engineering Technology on the College Math assessment is 63.
- To complete the program in a minimum of two years, students must have satisfied or completed Intermediate Algebra with Applications, 10-804-118, before entering the first semester of the program. This is equivalent to two years of High School Algebra and one year of High School Geometry. Intermediate Algebra with Applications, 10-804-118, is a prerequisite for the first semester courses DC 2: Circuits, 10-660-105; and Trigonometry with Applications, 10-804-196.
- Other beginning courses require mastery of algebra skills. For a description of algebra skills, see the Basic Education section of this catalog.

### Employment Potential

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

#### Electrical/Electronic Development Technician:

assists engineers in the design and development of experimental and prototype equipment and products.

#### Electrical/Electronic Maintenance Technician:

services and programs in-plant automatic control equipment, computers, robots, and other equipment.

**Electrical Test Technician:** tests, troubleshoots, and inspects electrical/electronics products (quality control testing).

**Electrical/Electronics Technician:** maintains equipment including motor controllers, cables, communication equipment, computers, security systems, CNC equipment, programmable controllers, robots, and automatic production equipment; works with engineers in building breadboard and prototype devices; and evaluates and tests electronic devices and systems.

**Field Service Technician:** services and overhauls equipment in the customer's facility; works with sales personnel; and demonstrates new equipment to potential customers.

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

- Computer Field Service Supervisor
- Electrical/Electronics Production Superintendent
- Electrical/Electronics Maintenance Supervisor
- Field Service Engineer
- Electrical Engineer

This program is fully eligible for financial aid.



## 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](http://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.

## Curriculum

The Electrical Engineering Technology Associate Degree is a two-year, four-semester program consisting of two tracks. Students take one of the two. Upon graduation, a student will have completed 70 credits.

### All Students Complete First Semester

Catalog No.	Description	Credits
10-620-140	Machine Wiring and Safety	1
10-660-101	Digital 1: Logic	1
10-660-102	Digital 2: Sequential	1
10-660-103	Digital 3: Registers	1
10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-660-106	DC 3: Circuit Theorems	1
10-801-195	Written Communication	3
10-804-196	Trigonometry w Apps	3
10-809-195	Economics	3
<b>Total Credits</b>		<b>16</b>

### All Students Complete Second Semester

Catalog No.	Description	Credits
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-109	AC 3: RLC Circuits	1
10-660-110	Electronics 1: Diodes-Basic	1
10-660-111	Electronics 2: Trans-Basic	1
10-660-112	Electronics 3: Op-Amps-Basic	1
10-660-113	Digital 4: ALU	1
10-660-114	Digital 5: Characteristics	1
10-660-115	Digital 6: Systems	1
10-801-197	Technical Reporting	3
10-804-195	College Algebra w Apps	3
<b>Total Credits</b>		<b>15</b>

### General Track Second Semester

Catalog No.	Description	Credits
	Elective	3
<b>Total Credits</b>		<b>3</b>

### Transfer Track Second Semester

Catalog No.	Description	Credits
10-806-143	College Physics 1	3
<b>Total Credits</b>		<b>3</b>

### All Students Complete Third Semester

Catalog No.	Description	Credits
10-605-160	Linear Electronics 1: Bjt Amps	1
10-605-161	Linear Electronics 2: Jfet Amp	1
10-605-162	Linear Electronics 3: Filters	1
10-605-163	Micro 1: Introduction	1
10-605-164	Micro 2: Technique	1
10-605-165	Micro 3: Interfaces	1
10-605-170	Datacomm 1: Introduction	1
10-605-171	Datacomm 2: Pulse Code Mod	1
10-605-172	Datacomm 3: Delta Modulation	1
10-662-112	DC/AC 3	3
10-809-172	Race Ethnic & Diversity	3
<b>Total Credits</b>		<b>15</b>

### General Track Third Semester

Catalog No.	Description	Credits
10-806-143	College Physics 1	3
	Elective	1
<b>Total Credits</b>		<b>4</b>

### Transfer Track Third Semester

Catalog No.	Description	Credits
10-804-198	Calculus 1	4
<b>Total Credits</b>		<b>4</b>

### All Students Complete Fourth Semester

Catalog No.	Description	Credits
10-605-166	Micro 4: Advanced Interfacing	1
10-605-167	Micro 5: Intermediate	1
10-605-180	Analog Comm 1: Noise Effects	1
10-605-181	Analog Comm 2: Am/Ssb	1
10-605-182	Analog Comm 3: Fm Systems	1
10-620-161	Power Electricity 1: Motors	1
10-620-162	Power Electricity 2: Motors	1
10-662-124	Electronic Circuit Analysis	3
10-809-198	Intro To Psychology	3
<b>Total Credits</b>		<b>13</b>

### General Track Fourth Semester

Catalog No.	Description	Credits
10-605-168	Micro 6: Advanced	1
10-620-159	Power Electronics 3: Drives	1
	Elective	2
<b>Total Credits</b>		<b>4</b>

### Transfer Track Fourth Semester

Catalog No.	Description	Credits
10-804-181	Calculus 2	4
<b>Total Credits</b>		<b>4</b>
<b>Total Program Credits</b>		<b>70</b>

### Suggested Electives:

Machine Tool Processes 1, 10-420-171  
 Machine Tool Processes 2, 10-420-172  
 Machine Fabrication 1, 10-442-150  
 Machine Fabrication 2, 10-442-151  
 Mechanics 2: Intermediate, 10-620-122  
 Mechanics 3: Systems, 10-620-123  
 Fluids 3: Intermediate Hy, 10-620-165  
 Rigging Systems 1, 10-620-105  
 Rigging Systems 2, 10-620-106

## Course Descriptions

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

### 10-605-160 LINEAR ELECTRONICS 1: BJT AMPLIFIERS

...review the characteristics of the bipolar junction transistor and Class A, Class AB and Class B bipolar junction transistor amplifiers.

### 10-605-161 LINEAR ELECTRONICS 2: JFET AMPLIFIERS

...characteristics of the junction field-effect (JFET) transistor amplifier and types of commonly used field effect transistor amplifiers. (Corequisite: 10-605-160, Linear Electronics 1: BJT Amplifiers)

### 10-605-162 LINEAR ELECTRONICS 3: PASSIVE/ACTIVE FILTERS

...review the characteristics of the passive RL, RC, RLC active filters, introduction to all types of commonly used passive and active filters. (Prerequisite: 10-605-161, Linear Electronics 2: JFET Amps)

### 10-605-163 MICROPROCESSORS 1: INTRODUCTION

...review of number, use of simulation software, fetch and execute, and fundamentals of assembly language programming.

### 10-605-164 MICROPROCESSORS 2: TECHNIQUE

...complex addressing modes, fields in programming, pseudo-ops, programming technique, and continued use of simulation software. (Prerequisite: 10-605-163, Micro 1: Intro)

### 10-605-165 MICROPROCESSORS 3: INTERFACES

...basic assembly language programming for operating a SCI, ADC, Timer and SPI, and continued use of simulation software. (Prerequisite: 10-605-164, Micro 2: Technique)

### 10-605-166 MICROPROCESSORS 4: ADVANCED INTERFACING

...writing rituals for switches, LEDs, LCDs, ADCs, keypads, stepper motors, DC motors, and infrared LEDs and the continued use of simulation software. (Prerequisite: 10-605-165, Micro 3: Interfaces)

*Electrical Engineering Technology course descriptions continue on next page...*

## **10-605-167 MICROPROCESSORS 5: INTERMEDIATE**

...designing and writing intermediate level programs in assembly language. The study will include the use of simulation software. (Prerequisite: 10-605-166, Micro 4: Advanced Interfacing)

## **10-605-168 MICROPROCESSORS 6: ADVANCED**

...designing and write assembly language programs that implement Finite State Machines, interrupts, divide routines, and the continued use of simulation software. (Prerequisite: 10-605-167, Micro 5: Intermediate)

## **10-605-170 DATACOMM 1: INTRODUCTION**

...introduction to pulse amplitude modulation, pulse amplitude modulation principles, sampling and signal reconstruction, and two-channel time division multiplexing. (Prerequisite: 10-660-103, Digital 3: Registers)

## **10-605-171 DATACOMM 2: PULSE CODE MODULATION**

...introduction to pulse code modulation, pulse code modulation principles, sampling and signal reconstruction, analog to digital conversion, and digital to analog conversion. (Prerequisite: 10-605-170, Data Comm 1: Introduction)

## **10-605-172 DATACOMM 3: DELTA MODULATION**

...introduction to delta modulation, delta modulation principles, sampling and signal reconstruction, and two-channel time division multiplexing. (Prerequisite: 10-605-171, Data Comm 2: Pulse Code)

## **10-605-180 ANALOG COMMUNICATIONS 1: NOISE EFFECTS**

...characteristics of noise in communications systems and analyze amplitude modulation. (Prerequisite: 10-605-162, Linear Electronics 3: Filters)

## **10-605-181 ANALOG COMMUNICATIONS 2: AM/SSB**

...characteristics of single sideband transmission and receiving systems. (Prerequisite: 10-605-180, Analog Comm 1: Noise Effects)

## **10-605-182 ANALOG COMMUNICATIONS 3: FM SYSTEMS**

...characteristics of frequency modulation transmission and receiving systems. (Prerequisite: 10-605-181, Analog Comm 2: AM/SSB)

## **10-620-140 MACHINE WIRING AND SAFETY**

...introduction to machine wiring, including basic documentation, labeling, and wiring practices; and an overview of NFPA 70 - machinery, safety and installation standards.

## **10-620-159 POWER ELECTRONICS 3: DRIVES**

...power circuitry of AC drives and application of industrial AC drives to AC motors. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ... DC motors and generator configuration, shunt, compound, and permanent magnet DC motor performance and characteristics.

**10-620-162 POWER ELECTRICITY 2: MOTORS** ...series DC, Compound DC, AC Induction, and Specialty machine performance and characteristics, and three-phase power systems. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operation using switch logic, ladder logic, and gate logic. Simplification methods using Boolean theorems and Karnaugh Maps, and timing diagram analysis.

**10-660-102 DIGITAL 2: SEQUENTIAL** ...operation and connection of Latches, RS flip-flops, JK flip-flops, and D flip-flops using timing diagram analysis, and some simple applications are studied. (Prerequisite: 10-660-101, Digital 1: Logic)

**10-660-103 DIGITAL 3: REGISTERS** ...analyze and design asynchronous up counters, down counters, presetable counters, ring counters, and Johnson counters, and analyze synchronous counters. Analyze and design various types of shift registers. (Prerequisite: 10-660-102, Digital 2: Sequential)

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, Current, Resistance, Ohm's Law, Power and Kirchoff's Voltage Law are defined.

**10-660-105 DC 2: CIRCUITS** ...analysis of parallel and series-parallel circuits. Application of Kirchoff's Current Law to parallel circuit combinations. Introduction of current sources and source conversions. (Corequisites: 10-804-118, Interm Algebra w Apps or equivalent; 10-660-104, DC 1: Intro)

**10-660-106 DC 3: CIRCUIT THEOREMS** ...analysis of circuits using various advanced methods. Branch, loop and node methods are studied. Eight network theorems are presented for the solution of circuit voltages and currents. (Prerequisite: 10-660-105, DC 2: Circuits)

**10-660-107 AC 1: PROPERTIES** ...introduction to the properties of Capacitors and Inductors including types and behavior in switching circuits. Inductor basics include a study of magnetic fields. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-804-196, Trigonometry w Apps.)

**10-660-108 AC 2: REACTANCE** ...study of the way inductive, capacitive and resistive components behave in a circuit excited by a sine waveform. Effective and average values of the sinewave are derived. (Corequisite: 10-660-107, AC 1: Properties)

**10-660-109 AC 3: RLC CIRCUITS** ...power flow in complex AC circuits based on resistive and reactive components. Description of the power triangle and power factor. Calculation of voltages and currents in complex AC circuits. (Prerequisite: 10-660-108, AC 2: Reactance)

## **10-660-110 ELECTRONICS 1: DIODES-BASIC**

...introduction to the characteristics and usage of semiconductor diodes in rectifiers and linear power supplies. Special diodes and diode circuits are also considered. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-660-107, AC 1: Properties;)

## **10-660-111 ELECTRONICS 2: TRANSISTOR-BASIC**

...introduction to the characteristics, bias and usage of semiconductor transistors in amplifying circuitry. BJTs, JFETs, MOSFETs and general amplifier characteristics are studied. (Prerequisite: 10-660-110, Electronics 1: Diodes-Basic)

### 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.
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- Descriptions of courses not found on this page can be found in the back of this catalog.

#### 10-660-112 ELECTRONICS 3: OP-AMPS-BASIC

...introduction to the circuit characteristics of integrated operational amplifiers. The various connections, inverting, non-inverting and comparator will be studied as well as specialized applications such as summers and filters. (Prerequisite: 10-660-111, Electronics 2: Transistor-Basic)

**10-660-113 DIGITAL 4: ALU** ...unsigned and signed arithmetic using binary numbers, the construction of adder circuits and subtraction circuits, and the analysis of a computer ALU is studied. (Prerequisite: 10-660-103, Digital 3: Registers)

**10-660-114 DIGITAL 5: CHARACTERISTICS** ...propagation delay, rise time, fall time, setup and hold time, asynchronous timing considerations, Schmitt trigger devices, one-shots and astable multivibrators, and synchronous counter design are studied. (Prerequisite: 10-660-113, Digital 4: ALU)

**10-660-115 DIGITAL 6: SYSTEMS** ...interconnection of ALU, registers, memory, decoders, control and sequence logic, glue-logic, clock and I/O into a working system is studied in block and circuit form. (Prerequisite: 10-660-114, Digital 5: Characteristics)

**10-662-112 DC/AC 3** ...apply Thevenins and Nortons Theorems in practical problems involving complex AC circuits. Solve complex AC circuits using Mesh and Nodal techniques and describe power flow in complex AC circuits. (Prerequisite: 10-660-109, AC 3: RLC Circuits)

**10-662-124 ELECTRONIC CIRCUIT ANALYSIS** ...develop equations for and analyze transistor amplifier circuits for bias, small signal gain, and transfer function including frequency response using Bode plot graphs of first order functions. (Prerequisite: 10-605-162, Linear Electronics 3: Filters)

**10-804-181 CALCULUS 2** ...continuation Calculus I. Topics: integration techniques, indeterminate forms, improper integrals, techniques of integration, applications to the physical sciences, first order linear differential equations, Infinite series including Maclaurin, Taylor, and Fourier. (Prerequisites: Recommendation: Completion of 10-804-198, Calculus I with a "C" or better.)





# Electrical Power Distribution

Program Code 314132

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Electrical Power Distribution prepares students to install, maintain, and operate electrical systems to supply electric energy to residential, commercial, and industrial customers, and joint gas and electric underground generation facilities.

### Program Outcomes

- Assist in the construction of electric transmission systems.
- Opportunity to secure a (CDL) commercial driver's license.
- Relate electrical theory to electric power systems.
- Work comfortably at heights.
- Climb poles and towers.
- Be knowledgeable in personal protective equipment to safely perform specific work.
- Identify sub-station components.
- Install underground electric systems.
- Operate electrical power distribution equipment.
- Troubleshoot power distribution and transmission systems.
- Communicate technical information.
- Assist in the construction of power distribution systems.
- Identify methods of electrical generation.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Be able to obtain a commercial driver's license.
- Place satisfactorily in the NWTC mathematics examination. Students should have mastered basic math skills. For a description of Basic Math, see the Basic Education section of catalog.

### Note

Students who have completed the Electrical Power Distribution technical diploma program have the opportunity to fulfill the requirements for a Utility Management certificate and/or apply these credits toward a Leadership Development and/or an Individualized Technical Studies associate degree.

### Employment Potential

A graduate of the program will have the potential for employment as a Line Technician, Lead Line Technician, Line Technician Supervisor, Cable TV Line Technician, Telephone Line Technician, Technician in an Electricity Generating Plant, or Installer/Maintainer of Underground Systems. Graduates in those jobs will perform construction, operations, and maintenance work on the electric power system and equipment.

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

- Line Coordinator
- Line Apprentice
- Safety Advisor
- Distribution Construction Designer
- Distribution Dispatcher
- Substation Electrician

### Curriculum

The Electrical Power Distribution Technical Diploma is a one-year, three-semester program. Upon graduation, a student will have completed 34 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-110	Elem Algebra w Apps	3
31-413-330	Line Elec Field Trng 1	5
31-413-353	Electricity-Basic	1
31-413-362	Line Elec-Safety 1	1
<b>Semester Total</b>		<b>10</b>

#### Second Semester

10-103-121	Micro: Word-Intro	1
31-413-335	Line Elec-Const Standards	1
31-413-336	Line Elec Field Trng 2-A	5
31-413-337	Line Elec Field Trng 2-B	5
31-413-355	Electricity-Linepersons	2
31-413-364	Line Elec-Safety 2	1
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-103-131	Micro: Excel-Intro	1
31-413-332	Line Elec Field Trng 3	5
31-413-361	Lineman-Safety/First Aid	1
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>8</b>
<b>Total Credits</b>		<b>34</b>

This program is fully eligible for financial aid.

### 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](http://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.*

#### **31-413-330 LINE ELECTRICIAN FIELD TRAINING 1**

...pole climbing, care of equipment/vehicle operation, setting and removing poles/line layout, pole framing, guys and anchors, conductor string, sagging, tying/transformers, operation, application, construction/safety.

#### **31-413-332 LINE ELECTRICIAN FIELD TRAINING 3**

...protective grounds, transmission, substation operations and maintenance, metering tools, transmission hot stick use and safety, and stray voltage precautions. (Prerequisite: 31-413-337, Line Electrician Field Training 2-B)

#### **31-413-335 LINE ELECTRICIAN-CONSTRUCTION**

**STANDARDS** ...distribution standards overhead, underground, primary, secondary, clearances, work practices, material and safe work practices.

#### **31-413-336 LINE ELECTRICIAN FIELD TRAINING 2-A**

...transformer installation, operation, maintenance; regulator, capacitor and OCR operation and maintenance. (Prerequisite: 31-413-330, Line Electrician Field Training 1)

#### **31-413-337 LINE ELECTRICIAN FIELD TRAINING 2-B**

...underground installation and equipment; street lighting operation and maintenance; protective equipment use; map/diagram reading, code clearance requirements; use of tree trimming methods and tools. (Corequisite: 31-413-336, Line Electrician Field Training 2-A)

#### **31-413-353 ELECTRICITY-BASIC** ...basic electricity:

fundamental laws and circuit analysis. (Prerequisite: Accepted into Electrical Power Distribution)

#### **31-413-355 ELECTRICITY-LINEPERSONS** ...electric

power/energy, three-phase voltage generation, three-phase circuit power, transformer operation principles, transformer connections, and safety practices in high voltage applications. (Prerequisite: 31-413-353, Electricity-Basic)

#### **31-413-361 LINEMAN-SAFETY/FIRST AID** ...substation

construction and maintenance, first aid procedures, mouth-to-mouth resuscitation, safety code analysis, recordkeeping, external heart massage, and safety/accident analysis. (Prerequisite: Accepted into Electrical Power Distribution)

#### **31-413-362 LINE ELECTRICIAN-SAFETY 1** ...general

rules, definitions, applications, responsibility, reporting accidents, injuries, hand and power tools, ladders, scaffolds, handling materials, operation of company automotive equipment. (Prerequisite: Accepted into Electrical Power Distribution)

#### **31-413-364 LINE ELECTRICIAN-SAFETY 2** ...electrical

section, line clearing, right-of-way maintenance; generating stations including theory and hands-on working on overhead lines; protective equipment; underground systems; tree trimming; and substations. (Prerequisite: 31-413-362, Line Electrician-Safety 1)

# Electricity

Program Code 314131

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Electricity prepares students to install, maintain, and service basic electrical equipment used in residential, commercial, and industrial settings.

### Program Outcomes

- Perform safe work practices.
- Apply National and Wisconsin State Electrical Codes to electrical installations.
- Install, maintain, and troubleshoot residential, commercial, and industrial electrical systems.
- Perform diagnostic testing on electrical systems.
- Apply basic calculations to electrical systems and installations.
- Demonstrate the operation of AC and DC motors.
- Install and troubleshoot basic motor control systems.
- Interpret electrical diagrams.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Math-Algebra/Trades 31-804-312 is a (pre/co) requisite for entry into the Electricity Technical Diploma program.
- Place satisfactorily in the NWTC mathematics and algebra examinations.
- Students should have mastered high school algebra skills and have a desire to learn advanced algebra and trigonometry. For a description of Algebra, see the Basic Education section of this catalog.

### Employment Potential

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

**Construction Electrician:** installs and services conduit, wire, cable, and equipment in new and existing residential, commercial, and industrial structures.

**Industrial Maintenance Electrician:** installs, maintains, and troubleshoots motors, motor controls, lighting, and other electrical systems in an industrial plant.

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

- Electrical Construction Supervisor
- Electrical Engineering Technician
- Journey-Level Electrician
- Electrical Contractor
- Electrical Maintenance Supervisor

### Curriculum

The Electricity Technical Diploma is a two-semester program broken down into four-quarters of nine-week courses. Upon graduation, a student will have completed 29 credits.

#### First Semester

Catalog No.	Description	Credits
31-413-314	DC Circuits	2
31-413-316	Residential Elec Code 1	1
31-413-319	Residential Wiring 1	3
31-413-326	Residential Elec Code 2	1
31-413-329	Residential Wiring 2	3
31-413-334	AC Circuits	2
31-449-301	Electrical Safety	1
31-804-312	Math-Algebra/Trades	1
<b>Semester Total</b>		<b>14</b>

#### Second Semester

31-413-327	Commercial Wiring Techniques	2
31-413-328	Motors/Transformers	2
31-413-339	Industrial Controls	3
31-413-345	Industrial Code	1
31-413-346	Commercial Elec Code	1
31-413-349	Electric Motor Control	3
31-413-359	Electrical Internship	1
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>29</b>

This program is fully eligible for financial aid.



### 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](http://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.*

**31-413-314 DC CIRCUITS** ...electron theory, electromotive force sources, voltage, current, resistance, power, ohm's law, series-parallel circuits and test equipment. (Prerequisite: 31-804-312, Math-Algebra/Trades)

**31-413-316 RESIDENTIAL ELECTRICAL CODE 1** ...National Electrical Code, residential circuits, conductor sizes, branch circuits, box fill calculations, switch control, branch circuit overcurrent protection and calculations, and ground fault circuit interrupters.

**31-413-319 RESIDENTIAL WIRING 1** ...residential electrical installation, national electrical code applications, residential circuits, box selection, conductor selector, receptacles, GFCI protection and switch control. (Corequisite: 31-413-316, Residential Elec Code 1)

**31-413-326 RESIDENTIAL ELECTRICAL CODE 2** ...National Electrical Code, residential circuit layout and design, small appliance circuits, special purpose outlets, service entrance equipment, calculations and demand factors. (Corequisite: 31-413-316, Residential Electrical Code 1)

**31-413-327 COMMERCIAL WIRING TECHNIQUES** ...raceways and fittings, conduit bending, wire pulling methods, fastening systems, lighting and low voltage wiring. (Corequisite: 31-413-346, Commercial Electrical Code)

**31-413-328 MOTORS/TRANSFORMERS** ...magnetism, electromagnetism, transformers, DC generators and motors, AC single-phase and three-phase motors, and an introduction to AC drives. (Prerequisite: 31-413-334, AC Circuits)

**31-413-329 RESIDENTIAL WIRING 2** ...residential circuit installations, National Electrical Code, application of residential design and layout, small appliance circuits and special purpose outlets. (Co-requisites: 31-413-319, Residential Wiring 1; 31-413-326, Residential Electrical Code 2)

**31-413-334 AC CIRCUITS** ...AC theory, inductance, capacitance, impedance, series and parallel AC circuits, AC power, power factor corrections, rectification of AC, Diodes and silicon controlled rectifiers. (Prerequisite: 31-804-312, Math-Algebra/Trades; Corequisite: 31-413-314, DC Circuits)

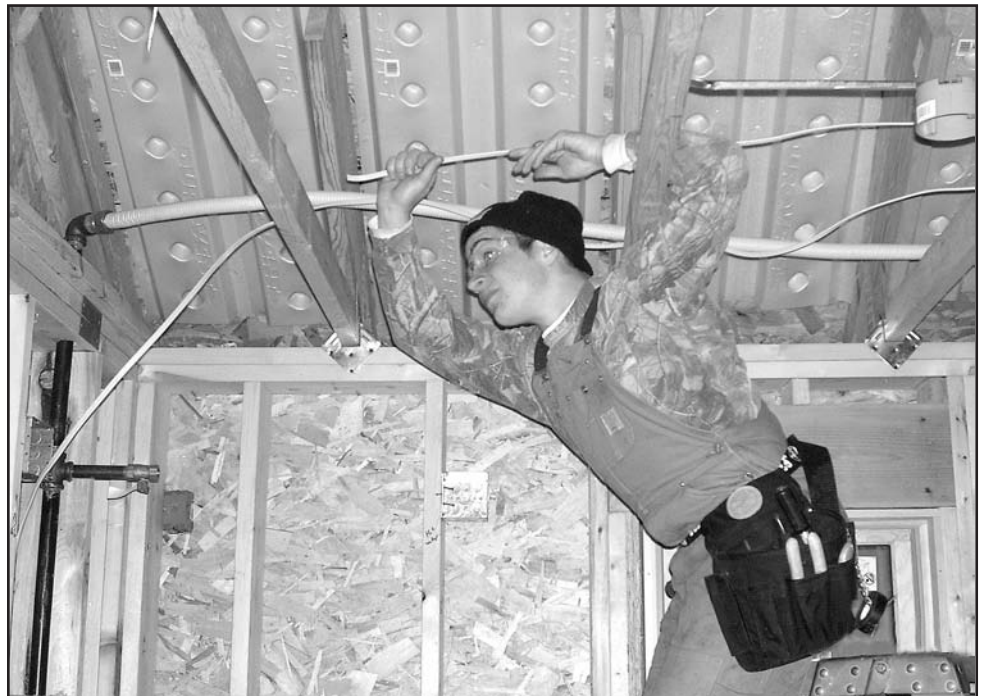
**31-413-339 INDUSTRIAL CONTROLS** ...electrical symbols, wiring diagrams, ladder diagrams, control logic, pilot devices, solenoids, relays, and time delay control. (Corequisite: 31-413-328, Motors and Transformers)

**31-413-345 INDUSTRIAL CODE** ...three-phase and single phase systems, motor branch circuits, overcurrent and overload protections, power factor, hazardous locations, harmonics and National Electric Code. (Corequisite: 31-413-346, Commercial Elec Code; 31-413-349, Electric Motor Control)

**31-413-346 COMMERCIAL ELECTRICAL CODE** ...commercial building plans and specifications, computing electrical loads and branch circuits, emergency systems, raceways, conduit fill, power and lighting circuits, motor & appliance circuits. (Prerequisite: 31-413-326, Residential Electrical Code 2)

**31-413-349 ELECTRIC MOTOR CONTROL** ...motor starters, overcurrent protection, overload protection, motor branch circuits, starting methods, troubleshooting motor circuits, and an introduction to PLC's. (Corequisite: 31-413-339, Industrial Controls)

**31-449-301 ELECTRICAL SAFETY** ...standard first aid, CPR and OSHA 10 hour course as it relates to the electrical field.



# Electro-Mechanical Technology

Program Code 106201

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Electro-Mechanical Technology prepares students for employment as plant-floor and field service technicians who assemble, install, troubleshoot, repair and modify mechanical, electrical systems; including programmable controllers found on industrial machinery.

### Program Outcomes

- Perform safe work practices.
- Understand and apply knowledge of electricity, electronics, hydraulics, electric motors and mechanics.
- Read technical drawings, schematics, and diagrams.
- Document technical information through descriptive writing, sketches/diagrams, mathematical expression, computation, and graphs.
- Perform electrical, mechanical, and fluid measurements by properly selecting tools and test equipment.
- Perform electrical/mechanical assembly/disassembly, repair, or calibrate components by properly selecting tools and equipment and following procedures.
- Understand the overall operation and control of machines.
- Understand the basic fastening skills related to machine fabrication and assembly requirements.
- Apply electrical skills to troubleshoot control and operator panels.
- Apply programming languages to the control of single programmable controllers and industrial networks.
- Apply critical thinking skills to solving problems.
- Effectively communicate and perform in a team environment.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Electro-Mechanical Technology on the College Math assessment is 50.
- Beginning courses require mastery of algebra skills. For a description of algebra skills, see the Basic Education section of this catalog.

### Employment Potential

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

**Automated Equipment Technician:** maintains and repairs electronically-controlled automatic production equipment including servo hydraulics equipment, programmable controllers, motor controllers, and robotic equipment.

**Electro-Mechanical Technician:** maintains and repairs electro-mechanical equipment including drive systems, position sensors, cabling, and automatic production equipment; works with mechanical and/or electrical engineers to install and evaluate electro-mechanical systems; and builds mock-ups of production equipment.

**Electronics Technician:** maintains and repairs electronic equipment including cables, communication equipment, computers, security systems, and CNC equipment; works with electronics engineers in building breadboard and prototype devices; and evaluates and tests electronic devices and systems.

**Field Service Technician:** services, repairs, and overhauls equipment in the customer's facility; works with sales personnel; and demonstrates new equipment to potential customers.

**Fluid Power Technician:** maintains and repairs industrial hydraulic/pneumatic production equipment, hydraulic/pneumatic control systems, hydraulic/pneumatic robots, and servo and proportional hydraulic systems.

**Installation Technician:** installs and sets up automated production equipment, robotic systems, and production control systems.

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

- Electro-Mechanical Service Supervisor
- Electro-Mechanical Shop Supervisor
- Electro-Mechanical Systems Test Engineer
- Field Service Supervisor
- Maintenance Group Manager
- Service Control Technician

### Curriculum

The Electro-Mechanical Technology Associate Degree is a two-year, four-semester program.

Upon graduation, a student will have completed 64 credits.

#### First Semester

Catalog No.	Description	Credits
10-420-171	Machine Tool Processes 1	1
10-442-150	Machine Fabrication 1	1
10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
10-660-101	Digital 1: Logic	1
10-660-102	Digital 2: Sequential	1
10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-664-100	Automation 1: Control Logic	1
10-664-101	Automation 2: Motor Control	1
10-804-118	Interm Algebra w Apps	4
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-420-172	Machine Tool Processes 2	1
10-442-151	Machine Fabrication 2	1
10-620-140	Machine Wiring and Safety	1
10-620-165	Fluids 3: Inter Hydraulics	1
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-110	Electronics 1: Diodes-Basic	1
10-664-102	Automation 3: PLC	1
10-664-103	Automation 4: PLC	1
10-664-104	Automation 5: PLC	1
10-804-196	Trigonometry w Apps	3
10-806-143	College Physics 1	3
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Drives	1
10-620-121	Mechanics 1: Basic	1
10-620-122	Mechanics 2: Intermediate	1
10-620-123	Mechanics 3: Systems	1
10-620-159	Power Electronics 3: Drives	1
10-620-161	Power Electricity 1: Motors	1
10-620-162	Power Electricity 2: Motors	1
10-664-105	Automation 6: PLC	1
10-664-151	Automation 8: HMI	1
10-664-160	Control 1: Discrete Systems	1
10-664-161	Control 2: Process Systems	1
10-664-162	Control 3: Motion Systems	1
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-620-105	Rigging Systems 1	1
10-620-166	Fluids 4: Advanced Hydraulics	1
10-620-170	Robotics - Introduction to	1
10-620-189	Machine Integrated Techniques	3
10-664-163	Control 4: Drive Performance	1
10-664-164	Control 5: Servo Systems	1
10-664-165	Control 6: Servo Systems	1
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>64</b>

#### Suggested Electives:

Automation CAD 1, 10-664-109  
Automation CAD 2, 10-664-110

This program is fully eligible for financial aid.



## 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](http://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.*

**10-420-171 MACHINE TOOL PROCESSES 1**...semi-precision and precision measurement, vertical and horizontal saws, principles of drilling and drilling machines.

**10-420-172 MACHINE TOOL PROCESSES 2** ...engine lathes and engine lathe operations, milling machines and milling operations, grinding and finishing. (Prerequisite: 10-420-171, Machine Tool Processes 1)

**10-442-150 MACHINE FABRICATION 1** ...a study of joining processes including welding, brazing, soldering, mechanical fasteners and adhesives.

**10-442-151 MACHINE FABRICATION 2** ...a study of fabrication processes including shears, saws, rolls, braces and benders. (Corequisite: 10-442-150, Machine Fabrication 1)

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics and applications of thyristors, power transistors, and switching devices. (Prerequisite: 10-660-107, AC 1: Properties)

**10-605-158 POWER ELECTRONICS 2: DRIVES** ...power circuitry of AC and DC drives and basic setup and application of an industrial DC and AC drives to DC and AC motors. (Corequisite: 10-605-157, Power Electronics 1: Devices)

**10-620-100 FLUIDS 1: BASIC PNEUMATICS** ...what fluid power is, differentiate between hydraulics and pneumatics, implement basic pneumatic circuits, utilize schematics, apply Pascal's law, define properties of fluids, implement airflow control and hydraulics cylinder circuits.

**10-620-101 FLUIDS 2: BASIC HYDRAULICS** ...hydraulic pumps, basic hydraulics actuator circuits, hydraulic schematics, apply Pascal's Law, summarize the effects of fluids friction, define properties of hydraulic energy, design hydraulic circuits with directional control valves. (Corequisite: 10-620-100, Fluids 1: Basic Pneumatics)

**10-620-105 RIGGING SYSTEMS 1** ...the basic skills of rigging, employment of hoists, slings, lifts, wire rope, and chain slings as part of rigging system.

**10-620-121 MECHANICS 1: BASIC** ...mechanical drive system components related to V-belt drives, chain drives, and gear drives.

**10-620-122 MECHANICS 2: INTERMEDIATE** ...mechanical drive system components related to multiple shaft drives, heavy-duty V-belt Drives, synchronous belt drives, lubrication, and alignment. (Prerequisite: 10-620-121, Mechanics 1: Basic)

**10-620-123 MECHANICS 3: SYSTEMS** ...application of correct couplings to mechanical systems, Heavy-duty Chain Drives, Maintenance of Brakes and Clutches, selection of brake/clutch mechanisms, and specification of linear ball bushings and ball screw drives. (Prerequisite: 10-620-122, Mechanics 2: Intermediate)

**10-620-140 MACHINE WIRING AND SAFETY** ...introduction to machine wiring, including basic documentation, labeling, and wiring practices; and an overview of NFPA 70 - machinery, safety and installation standards.

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC drives and application of industrial AC drives to AC motors. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ...DC motors and generator configuration, shunt, compound, and permanent magnet DC motor performance and characteristics.

**10-620-162 POWER ELECTRICITY 2: MOTORS** ...series DC, Compound DC, AC Induction, and Specialty machine performance and characteristics, and three-phase power systems. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-620-165 FLUIDS 3: INTERMEDIATE HYDRAULICS** ...design of cylinder actuating circuits with pressure-compensated flow control valves, how to control pressure, pilot-operated check valve applications, accumulator operation and application, hydraulic motor types and applications. (Prerequisite: 10-620-101, Fluids 2: Basic Hydraulics)

**10-620-166 FLUIDS 4: ADVANCED HYDRAULICS** ...components of hydraulic pump power, characteristics of fluid conductors, issues of hydraulic system maintenance, basics of hydraulic flow and pressure in pipelines, design a hydraulic system from a specification.

**10-620-170 ROBOTICS - INTRODUCTION TO** ...introductory study of the application, operation, programming and troubleshooting of Industrial Robots. (Prerequisite: 10-664-160, Control 1: Transducers OR 10-605-165, Micro 3: Interfaces)

**10-620-189 MACHINE INTEGRATED TECHNIQUES** ...application of machine fabrication techniques, automation products to manufacturing processes including PLC, Drives, Motors (Electric and Hydraulics), Sensors. (Prerequisite: Completion of 3rd semester courses)

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operation using switch logic, ladder logic, and gate logic. Simplification methods using Boolean theorems and Karnaugh Maps, and timing diagram analysis.

**10-660-102 DIGITAL 2: SEQUENTIAL** ...operation and connection of Latches, RS flip-flops, JK flip-flops, and D flip-flops using timing diagram analysis, and some simple applications are studied. (Prerequisite: 10-660-101, Digital 1: Logic)

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, Current, Resistance, Ohm's Law, Power and Kirchoff's Voltage Law are defined.

**10-660-105 DC 2: CIRCUITS** ...analysis of parallel and series-parallel circuits. Application of Kirchoff's Current Law to parallel circuit combinations. Introduction of current sources and source conversions. (Corequisites: 10-804-118, Interm Algebra w Apps or equivalent; 10-660-104, DC 1: Intro)

**10-660-107 AC 1: PROPERTIES** ...introduction to the properties of Capacitors and Inductors including types and behavior in switching circuits. Inductor basics include a study of magnetic fields. (Prerequisite: 10-660-105, DC 2: Corequisite: 10-804-196, Trigonometry w Apps.)

**10-660-108 AC 2: REACTANCE** ...study of the way inductive, capacitive and resistive components behave in a circuit excited by a sine waveform. Effective and average values of the sinewave are derived. (Corequisite: 10-660-107, AC 1: Properties)

**10-660-110 ELECTRONICS 1: DIODES-BASIC** ...introduction to the characteristics and usage of semiconductor diodes in rectifiers and linear power supplies. Special diodes and diode circuits are also considered. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-660-107, AC 1: Properties)

## 10-664-100 AUTOMATION 1: CONTROL LOGIC

...electric motor control components such as switches, relays, starters, transformers, and safely mount and install motor and motor control components and perform related wiring and troubleshooting of motor control circuits.

**10-664-101 AUTOMATION 2: MOTOR CONTROL** ...electric motor control components such as sensors, timers and counters. (Corequisite: 10-664-100, Automation 1: Control Logic)

**10-664-102 AUTOMATION 3: PLC** ...basic programmable logic controller programming and troubleshooting.

**10-664-103 AUTOMATION 4: PLC** ...troubleshooting a PLC System, applying Event Sequencing, developing PLC applications, applying timer instructions and counter instructions. (Corequisite: 10-664-102, Automation 3: PLC)

**10-664-104 AUTOMATION 5: PLC** ...application, troubleshooting, and implementation of program control, math and data move instructions, analog I/O modules, and producing a PLC program from specification. (Corequisite: 10-664-103, Automation 4: PLC)

**10-664-105 AUTOMATION 6: PLC** ...programming a PLC system to operate a discrete and analog process adhering to a functional specification or timing diagram. (Prerequisite: 10-664-104, Automation 5: PLC)

**10-664-151 AUTOMATION 8: HMI** ...the functions of Human Machine Interface, Operator Interface Terminal software and generation of PLC program and screens adhering to written specification using Operator Interface Terminal and PLC software. (Prerequisite: 10-664-105, Automation 6: PLC)

## 10-664-160 CONTROL 1: DISCRETE SYSTEMS

...applications and utilization of motion feedback devices, force measurement devices, temperature sensors, and fluid measurement devices. (Prerequisite: 10-660-110, Electronics 1: Diodes Basic)

**10-664-161 CONTROL 2: PROCESS SYSTEMS** ...Open-Loop versus Closed-Loop systems, industrial control systems, two-position control and its applications, PID control and its applications, and relationship between process response and proper mode of control. (Corequisite: 10-664-160, Control 1: Discrete Systems)

**10-664-162 CONTROL 3: MOTION SYSTEMS** ...hydraulic and pneumatic proportional/servo valves, servo motors, configuration and programming of an analog motion control system. (Corequisite: 10-664-161, Control 2: Process Systems)

**10-664-163 CONTROL 4: DRIVE PERFORMANCE** ...DC and AC Drive System performance, specification of AC and DC Drive control methods for given application, and integration of a drive system into a control network. (Prerequisite: 10-664-161, Control 2: Fundamentals)

**10-664-164 CONTROL 5: SERVO SYSTEMS** ...motion control troubleshooting and fault recovery, advanced motion control programming, integration of motion control system and motion control network. (Prerequisite: 10-664-163, Control 4: Drive Performance)

**10-664-165 CONTROL 6: SERVO SYSTEMS** ...development and verification of motion control components and programming given description of operation, and leading technologies for advanced motion control. (Prerequisite: 10-664-164, Control 5: Servo Systems)

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Electronics (with optional Biomedical specialty) program offers students the option between tracks specializing in biomedical or general electronics. The biomedical track prepares the student for a position as a technician for hospitals or medical equipment manufacturers. The general electronics track prepares the student to operate, test, maintain, and troubleshoot electronic equipment and work with research and design engineers.

### Program Outcomes

- Describe the various digital modulation techniques.
- Identify components of power switching devices and circuits.
- Evaluate power switching circuits.
- Program microprocessor interface circuits.
- Measure electrical parameters of RF circuits.
- Describe wireless analog communication techniques.
- Use computer assembly language.
- Measure wide-band circuit parameters.
- Describe transfer characteristics of frequency sensitive linear circuits.
- Analyze an ON/OFF machine control circuit.
- Describe the assembly and interconnections of a microprocessor system.
- Predict operation of circuits containing active components.
- Identify the component and appropriate nomenclature of basic electronic symbols.
- Apply Boolean theorems to basic digital circuits.
- Apply circuit theorems to AC/DC RLC circuits.
- Use basic electronic tools.
- Work in teams.
- Develop an industry acceptable work ethic.
- Communicate orally using common technical terminology.
- Write a technical document.
- Use office suite software package tools.
- Manipulate electronic formulas.
- Relate mathematics to the field of electronics.
- Interpret graphical data.
- Solve problems using algebra, trigonometry, complex numbers, logarithms, and exponentials.
- Use common test equipment to measure circuit parameters.
- Verify measured values.
- Machine code a processor.
- Adhere to laboratory safety standards.
- Operate microprocessor interface circuits.
- Analyze and troubleshoot biomedical electronics equipment (Biomedical track specific).

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Electronics (with optional Biomedical specialty) on the College Math assessment is 50.
- Beginning courses require mastery of algebra skills. For a description of algebra skills, see the Basic Education section of this catalog.

### Additional Requirements for Students Pursuing the Biomedical Track

#### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Employment Potential

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

**Electronic Maintenance Technician:** services and programs in-plant automatic control equipment, computers, robots, and other electronic equipment.

**Electronic Test Technician:** tests, troubleshoots, and inspects electronics products (quality control testing).

**Electronics Technician:** maintains electronic equipment including motor controllers, cables, communication equipment, computers, security systems, CNC equipment, programmable controllers, robots, and automatic production equipment; works with an electronics engineer in building breadboard and prototype devices; and evaluates and tests electronic devices and systems.

**Field Service Technician:** services and overhauls equipment in the customer's facility; works with sales personnel; and demonstrates new equipment to potential customers.

**Biomedical Equipment Technician, also called Biomedical Engineering Technicians or BMETs:** constructs, tests, repairs, and maintains electromedical equipment of all sorts, including electrosurgical equipment, cardiovascular equipment, kidney dialysis machines, respirators, vital signs data equipment, telemetry transmitters and receivers, radiology equipment and nuclear medicine equipment.

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

- Computer Field Service Supervisor
- Electronics Production Superintendent
- Electronics Maintenance Supervisor

### 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.



## 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](http://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.

## Curriculum

The Electronics (with optional Biomedical specialty) Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

### All Students Complete First Semester

Catalog No.	Description	Credits
10-660-100	Electronic Fabrication - Intro	1
10-660-101	Digital 1: Logic	1
10-660-102	Digital 2: Sequential	1
10-660-103	Digital 3: Registers	1
10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-660-106	DC 3: Circuit Theorems	1
10-804-118	Interm Algebra w Apps	4
10-809-198	Intro to Psychology	3
<b>Total Credits</b>		<b>14</b>

### Electronics Technology First Semester

Catalog No.	Description	Credits
10-620-140	Machine Wiring and Safety	1
10-809-166	Intro to Ethics: Theory & App	3
<b>Total Credits</b>		<b>4</b>

### Biomedical Technology First Semester

Catalog No.	Description	Credits
*10-806-134	General Chemistry	4
<b>Total Credits</b>		<b>4</b>

### All Students Complete Second Semester

Catalog No.	Description	Credits
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-109	AC 3: RLC Circuits	1
10-660-110	Electronics 1: Diodes-Basic	1
10-660-111	Electronics 2: Trans-Basic	1
10-660-112	Electronics 3: Op-Amps-Basic	1
10-660-113	Digital 4: ALU	1
10-660-114	Digital 5: Characteristics	1
10-804-196	Trigonometry w Apps	3
10-809-172	Race Ethnic & Diversity	3
<b>Total Credits</b>		<b>14</b>

### Electronics Technology Second Semester

Catalog No.	Description	Credits
	Elective	3
<b>Total Credits</b>		<b>3</b>

### Biomedical Technology Second Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
<b>Total Credits</b>		<b>3</b>

### All Students Complete Third Semester

Catalog No.	Description	Credits
10-605-160	Linear Electronics 1: BJT Amps	1
10-605-161	Linear Electronics 2: JFET Amp	1
10-605-162	Linear Electronics 3: Filters	1
10-605-163	Micro 1: Introduction	1
10-605-164	Micro 2: Technique	1
10-605-165	Micro 3: Interfaces	1
10-605-170	Datacomm 1: Introduction	1
10-605-171	Datacomm 2: Pulse Code Mod	1
10-605-172	Datacomm 3: Delta Modulation	1
10-801-195	Written Communication	3
<b>Total Credits</b>		<b>12</b>

### Electronics Technology Third Semester

Catalog No.	Description	Credits
10-605-157	Power Electronics 1: Devices	1
10-806-143	College Physics 1	3
<b>Total Credits</b>		<b>6</b>

### Biomedical Technology Third Semester

Catalog No.	Description	Credits
* 10-806-189	Basic Anatomy	3
<b>Total Credits</b>		<b>3</b>

### Fourth Semester All Students Must Complete

Catalog No.	Description	Credits
10-605-166	Micro 4: Advanced Interfacing	1
10-605-167	Micro 5: Intermediate	1
10-605-168	Micro 6: Advanced	1
10-605-174	Datacomm 5: Fiber Optics-Intro	1
10-605-175	Datacomm 6: Fiber Optics-Adv	1
10-605-180	Analog Comm 1: Noise Effects	1
10-605-181	Analog Comm 2: AM/SSB	1
10-605-182	Analog Comm 3: FM Systems	1
10-801-197	Technical Reporting	3
10-809-195	Economics	3
<b>Total Credits</b>		<b>14</b>

### Electronics Technology Fourth Semester

Catalog No.	Description	Credits
10-605-158	Power Electronics 2: Drives	1
10-605-173	Datacomm 4: Digital Modulation	1
10-620-159	Power Electronics 3: Drives	1
<b>Total Credits</b>		<b>4</b>

### Biomedical Technology Fourth Semester

Catalog No.	Description	Credits
* 10-605-106	Biomed Electronics 1	1
* 10-605-107	Biomed Electronics 2	1
* 10-605-108	Biomed Electronics 3	1
* 10-605-109	Biomed Electronics 4	1
<b>Total Credits</b>		<b>4</b>
<b>Total Credits</b>		<b>68</b>

\* In order to successfully complete the Biomedical track, no final grade lower than a "C" is acceptable in any of the courses marked with an asterisk.

### Suggested Electives:

Manufacturing Practices: 10-623-107  
Automation 7: PLC, 10-664-150  
Automation 8: HMI, 10-664-151  
Automation 9: HMI, 10-664-152  
Control 1: Transducers, 10-664-160  
Control 2: Fundamentals, 10-664-161  
Control 3: Process System, 10-664-162  
Control 4: Drive Performa, 10-664-163  
Control 5: Servo Systems, 10-664-164  
Control 6: Servo Systems, 10-664-165

### Course Descriptions

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

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-605-106 BIOMED ELECTRONICS 1: SIGNALING** ...the study will present the characteristics of biomedical electronics signaling and provide a survey of biomedical electronics signaling systems. (Prerequisites: 10-605-162, Linear Electronics 3: Filters; 10-605-172, Datacomm 3: Delta Modulation)

**10-605-107 BIOMED ELECTRONICS 2: INSTRUMENTATION** ...study will present the characteristics of biomedical electronics instrumentation and provide a survey of biomedical electronics instrumentation. (Prerequisite: 10-605-106, Biomed Electronics 1)

**10-605-108 BIOMED ELECTRONICS 3: NETWORKING** ...study will present the characteristics of biomedical electronics networking and provide a survey of biomedical electronics networking systems. (Prerequisite: 10-605-107, Biomed Electronics 2)

**10-605-109 BIOMED ELECTRONICS 4: CALIBRATION** ...study will present the characteristics of biomedical electronics calibration and provide a survey of biomedical electronics calibration. (Prerequisite: 10-605-108, Biomed Electronics 3)

This program is fully eligible for financial aid.

*Electronics (with optional Biomedical specialty) course descriptions continue on next page ...*

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics and applications of thyristors, power transistors, and switching devices. (Prerequisite: 10-660-107, AC 1: Properties)

**10-605-158 POWER ELECTRONICS 2: DRIVES** ...power circuitry of AC and DC drives and basic setup and application of an industrial DC and AC drives to DC and AC motors. (Corequisite: 10-605-157, Power Electronics 1: Devices)

**10-605-160 LINEAR ELECTRONICS 1: BJT AMPLIFIERS** ...review the characteristics of the bipolar junction transistor and Class A, Class AB and Class B bipolar junction transistor amplifiers.

**10-605-161 LINEAR ELECTRONICS 2: JFET AMPLIFIERS** ...characteristics of the junction field-effect (JFET) transistor amplifier and types of commonly used field effect transistor amplifiers. (Corequisite: 10-605-160, Linear Electronics 1: BJT Amplifiers)

**10-605-162 LINEAR ELECTRONICS 3: PASSIVE/ACTIVE FILTERS** ...review the characteristics of the passive RL, RC, RLC active filters, introduction to all types of commonly used passive and active filters. (Prerequisite: 10-605-161, Linear Electronics 2: JFET Amps)

**10-605-163 MICROPROCESSORS 1: INTRODUCTION** ...review of number, use of simulation software, fetch and execute, and fundamentals of assembly language programming.

**10-605-164 MICROPROCESSORS 2: TECHNIQUE** ...complex addressing modes, fields in programming, pseudo-ops, programming technique, and continued use of simulation software. (Prerequisite: 10-605-163, Micro 1: Intro)

**10-605-165 MICROPROCESSORS 3: INTERFACES** ...basic assembly language programming for operating a SCI, ADC, Timer and SPI, and continued use of simulation software. (Prerequisite: 10-605-164, Micro 2: Technique)

**10-605-166 MICROPROCESSORS 4: ADVANCED INTERFACING** ...writing rituals for switches, LEDs, LCDs, ADCs, keypads, stepper motors, DC motors, and infrared LEDs and the continued use of simulation software. (Prerequisite: 10-605-165, Micro 3: Interfaces)

**10-605-167 MICROPROCESSORS 5: INTERMEDIATE** ...designing and writing intermediate level programs in assembly language. The study will include the use of simulation software. (Prerequisite: 10-605-166, Micro 4: Advanced Interfacing)

**10-605-168 MICROPROCESSORS 6: ADVANCED** ...designing and write assembly language programs that implement Finite State Machines, interrupts, divide routines, and the continued use of simulation software. (Prerequisite: 10-605-167, Micro 5: Intermediate)

**10-605-170 DATACOMM 1: INTRODUCTION** ...introduction to pulse amplitude modulation, pulse amplitude modulation principles, sampling and signal reconstruction, and two-channel time division multiplexing. (Prerequisite: 10-660-103, Digital 3: Registers)

**10-605-171 DATACOMM 2: PULSE CODE MODULATION** ...introduction to pulse code modulation, pulse code modulation principles, sampling and signal reconstruction, analog to digital conversion, and digital to analog conversion. (Prerequisite: 10-605-170, Data Comm 1: Introduction)

**10-605-172 DATACOMM 3: DELTA MODULATION** ...introduction to delta modulation, delta modulation principles, sampling and signal reconstruction, and two-channel time division multiplexing. (Prerequisite: 10-605-171, Data Comm 2: Pulse Code)

**10-605-173 DATACOMM 4: DIGITAL MODULATION** ...introduction to digital modulation, line coding and synchronization, principles of frequency shift keying, and principles of amplitude shift and phase shift keying. (Prerequisite: 10-605-172, Datacomm 3: Delta Modulation)

**10-605-174 DATACOMM 5: FIBER OPTICS-INTRODUCTION** ...introduction to fiber optic signal processing, transmission, and reception. (Corequisite: 10-605-172, Data Comm 3: Delta Modulation)

**10-605-175 DATACOMM 6: FIBER OPTICS-ADVANCED** ...advanced demonstration of skills required to analyze and troubleshoot fiber optic signal processing, transmission, and reception.

**10-605-180 ANALOG COMMUNICATIONS 1: NOISE EFFECTS** ...characteristics of noise in communications systems and analyze amplitude modulation. (Prerequisite: 10-605-162, Linear Electronics 3: Filters)

**10-605-181 ANALOG COMMUNICATIONS 2: AM/SSB** ...characteristics of single sideband transmission and receiving systems. (Prerequisite: 10-605-180, Analog Comm 1: Noise Effects)

**10-605-182 ANALOG COMMUNICATIONS 3: FM SYSTEMS** ...characteristics of frequency modulation transmission and receiving systems. (Prerequisite: 10-605-181, Analog Comm 2: AM/SSB)

**10-620-140 MACHINE WIRING AND SAFETY** ...introduction to machine wiring, including basic documentation, labeling, and wiring practices; and an overview of NFPA 70 - machinery, safety and installation standards.

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC drives and application of industrial AC drives to AC motors. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-660-100 ELECTRONIC FABRICATION - INTRO TO** ...the study will include an introduction to electronics fabrication techniques, including basic soldering and assembly, and an overview of connectors and printed circuit board construction.

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operation using switch logic, ladder logic, and gate logic. Simplification methods using Boolean theorems and Karnaugh Maps, and timing diagram analysis.

**10-660-102 DIGITAL 2: SEQUENTIAL** ...operation and connection of Latches, RS flip-flops, JK flip-flops, and D flip-flops using timing diagram analysis, and some simple applications are studied. (Prerequisite: 10-660-101, Digital 1: Logic)

**10-660-103 DIGITAL 3: REGISTERS** ...analyze and design asynchronous up counters, down counters, presettable counters, ring counters, and Johnson counters, and analyze synchronous counters. Analyze and design various types of shift registers. (Prerequisite: 10-660-102, Digital 2: Sequential)

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, Current, Resistance, Ohm's Law, Power and Kirchoff's Voltage Law are defined.

### Please Note

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- Descriptions of courses not found on this page can be found in the back of this catalog.

**10-660-105 DC 2: CIRCUITS** ...analysis of parallel and series-parallel circuits. Application of Kirchhoff's Current Law to parallel circuit combinations. Introduction of current sources and source conversions. (Corequisites: 10-804-118, Interm Algebra w Apps OR equivalent; 10-660-104, DC 1: Intro)

**10-660-106 DC 3: CIRCUIT THEOREMS** ...analysis of circuits using various advanced methods. Branch, loop and node methods are studied. Eight network theorems are presented for the solution of circuit voltages and currents. (Prerequisite: 10-660-105, DC 2: Circuits)

**10-660-107 AC 1: PROPERTIES** ...introduction to the properties of Capacitors and Inductors including types and behavior in switching circuits. Inductor basics include a study of magnetic fields. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-804-196, Trigonometry w Apps.)

**10-660-108 AC 2: REACTANCE** ...study of the way inductive, capacitive and resistive components behave in a circuit excited by a sine waveform. Effective and average values of the sinewave are derived. (Corequisite: 10-660-107, AC 1: Properties)

**10-660-109 AC 3: RLC CIRCUITS** ...power flow in complex AC circuits based on resistive and reactive components. Description of the power triangle and power factor. Calculation of voltages and currents in complex AC circuits. (Prerequisite: 10-660-108, AC 2: Reactance)

**10-660-110 ELECTRONICS 1: DIODES-BASIC** ...introduction to the characteristics and usage of semiconductor diodes in rectifiers and linear power supplies. Special diodes and diode circuits are also considered. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-660-107, AC 1: Properties;)

**10-660-111 ELECTRONICS 2: TRANSISTOR-BASIC** ...introduction to the characteristics, bias and usage of semiconductor transistors in amplifying circuitry. BJTs, JFETs, MOSFETs and general amplifier characteristics are studied. (Prerequisite: 10-660-110, Electronics 1: Diodes-Basic)

**10-660-112 ELECTRONICS 3: OP-AMPS-BASIC** ...introduction to the circuit characteristics of integrated operational amplifiers. The various connections, inverting, non-inverting and comparator will be studied as well as specialized applications such as summers and filters. (Prerequisite: 10-660-111, Electronics 2: Transistor-Basic)

**10-660-113 DIGITAL 4: ALU** ...unsigned and signed arithmetic using binary numbers, the construction of adder circuits and subtraction circuits, and the analysis of a computer ALU is studied. (Prerequisite: 10-660-103, Digital 3: Registers)

**10-660-114 DIGITAL 5: CHARACTERISTICS** ...propagation delay, rise time, fall time, setup and hold time, asynchronous timing considerations, Schmitt trigger devices, one-shots and astable multivibrators, and synchronous counter design are studied. (Prerequisite: 10-660-113, Digital 4: ALU)





# Emergency Medical Technician-Basic

Program Code 305313

## Technical Diploma

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Emergency Medical Technician-Basic students perform emergency patient care and basic life support skills in compliance with the Wisconsin scope of practice including the transport of injured and ill patients to hospital emergency departments.

### Program Outcomes

- Apply preparatory aspects of emergency care.
- Perform airway management.
- Perform patient assessment.
- Manage medical, behavioral, and trauma patients.
- Adapt principles to pediatric cases.
- Perform field operations.

### Requirements for Program Entry

- First priority for admission is given to applicants sponsored by a Wisconsin licensed ambulance service. Un-sponsored applicants are admitted only after the program is filled with sponsored students.
- Must be 18 years or older to enter training.
- Current CPR recognition card (American Heart Association Health Care Provider or American Red Cross Professional Rescuer).
- Proof of current health status and immunizations.
- NWTC is required to comply with the Wisconsin Caregiver Law.

### Employment Potential

A graduate with an EMT-Basic Technical Diploma will have the potential for employment as an Emergency Medical Technician. Ambulance services in Wisconsin are volunteer, private, fire based or hospital based.

**Emergency Medical Technician:** Performs emergency patient care and basic life support in the field, transporting sick and injured patients to hospital emergency departments.

### Note

- Successful program completion prepares and entitles the student to take the state license examination. A graduate is licensed only after successful completion of the licensing examination and application for a state license.
- Completion of First Responder (30-531-302) prior to program entry is highly recommended.

### Curriculum

The EMT-Basic Technical Diploma is a one-semester program. Upon graduation, a student will have completed 5 credits. This course is 144 hours.

#### First Semester

Catalog No.	Description	Credits
10-531-102	EMT Basic	5
<b>Semester Total</b>		<b>5</b>
<b>Total Credits</b>		<b>5</b>

### Course Description

*This course provides an opportunity for students to develop the knowledge, skills, and understanding required for employment in this field.*

**10-531-102 EMERGENCY MEDICAL TECHNICIAN BASIC...** preparatory aspects, airway management, patient assessment, medical/behavioral cases, trauma care, pediatric cases, and field operations in basic life-support emergency medical care. (Prerequisite: Accepted into Emergency Medical Tech-Basic)

This program is *not* eligible for financial aid.

# EMT Intermediate Technician

Program Code 305316

## Technical Diploma

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

EMT Intermediate Technician students are Wisconsin licensed EMT-Basics seeking to upgrade their skills to the EMT Intermediate Technician level. EMT Intermediate Technician students perform emergency patient care, basic life support, limited advanced life support in compliance with the Wisconsin scope of practice including transport of injured and ill patients to hospital emergency departments.

### Program Outcomes

- Apply the preparatory aspects of EMT Intermediate Technician care.
- Perform intravenous therapy.
- Perform clinical skill competencies.
- Demonstrate usage of basic pharmacological principles.
- Manage cardiac, diabetic and narcotic overdose cases using medications.

### Requirements for Program Entry

- Must be 18 years or older to enter training.
- Affiliation with a Wisconsin licensed ambulance service approved at the Intermediate Technician level.
- Current Wisconsin EMT-Basic license.
- Current CPR recognition card (American Heart Association Health Care Provider or American Red Cross Professional Rescuer).
- Physician medical director endorsement of EMT skill competency.
- Proof of current health status and immunizations.
- NWTC is required to comply with the Wisconsin Caregiver Law.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

A graduate with an EMT Intermediate Technical Diploma will have the potential for employment as an EMT Intermediate Technician with a Wisconsin ambulance service licensed to provide EMT Intermediate Technician level care.

**EMT Intermediate Technician:** performs emergency patient care, basic life support, limited advanced life support in the field, transporting sick and injured patients to hospital emergency departments.

### Note

Successful program completion prepares and entitles the student to take the state license examination. A graduate is licensed only after successful completion of the licensing examination and application for a state license.

### Curriculum

The EMT Intermediate Technician Technical Diploma is a one-semester program. Upon graduation, a student will have completed two credits. This course is 92 hours.

#### First Semester

Catalog No.	Description	Credits
30-531-340	EMT-Intermediate Technician	2
<b>Semester Total</b>		<b>2</b>
<b>Total Credits</b>		<b>2</b>

### Course Description

*This course provides an opportunity for students to develop the knowledge, skills, and understanding required for employment in this field.*

#### 30-531-340 EMT-INTERMEDIATE TECHNICIAN

...preparatory aspects, clinical decision-making, basic pharmacology, intravenous therapy, cardiovascular cases, diabetic, narcotic overdose, pediatrics, terrorism response and clinical skill competencies of EMT-I.V. Technician level care.

This program is *not* eligible for financial aid.

# Farm Business and Production Management

Program Code 300901

## Technical Diploma

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Farm Business and Production Management covers basic farming production and business management principles needed to be an efficient farmer. Formal classes are delivered District-wide at locations convenient for the farmers.

### Program Outcomes

- Calculate farm business cost of production for forage, grain, beef, pork, and milk.
- Prepare and assess a livestock management plan that is environmentally friendly.
- Prepare and assess a business financial plan.
- Develop and assess a soil and crop management plan that is environmentally friendly.
- Own, operate, and/or be employed in an agriculture-related industry.
- Implement a business, soil, crop, and livestock management plan that is environmentally friendly.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Communications: ability to listen, write complete sentences, spell accurately, and express ideas well verbally.
- Science: basic plant and animal biology, chemistry, and applied physics.
- Ability to use computer operating skills: keyboarding at 30 words per minute.
- Basic math defined as addition, subtraction, multiplication and division. Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

A graduate of the program will have basic skills necessary to own and operate or be employed on a farm.

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

- Dairy Herdsperson
- General Farm Manager
- Farm Records Manager
- Crop Supervisor
- Livestock Feeding Specialist
- Farm Equipment and Facilities Maintenance Manager
- Farm Service Employee
- Field Equipment Operator

### Note

Tuition assistance is available through the Wisconsin Dept. of Agriculture and the Wisconsin Technical College Categorical Funding Tuition Assistance Grant; other local scholarships are available.

### Curriculum

The Farm Business and Production Management Technical Diploma is a six-year, part-time program. Upon graduation, a student will have completed 24 credits.

#### First Semester

Catalog No.	Description	Credits
30-090-387	Farm Record/Business Analysis	4
30-090-388	Crop Management	4
30-090-391	Livestock Management	4
30-090-392	Livestock Nutrition	4
30-090-393	Soil Management	4
30-090-394	Farm Business Operation	4
<b>Semester Total</b>		<b>24</b>
<b>Total Credits</b>		<b>24</b>

This program is *not* eligible for financial aid.



### 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](http://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.*

#### 30-090-387 FARM RECORD/BUSINESS ANALYSIS

...Farm Business mission, objectives, goals, use of farm credit, farm business arrangements, orderly farm transfer, farm estate planning, farm income tax preparation, computer records and Farm Business Analysis.

**30-090-388 CROP MANAGEMENT** ...economics, alternative crop strategies, production management, variety selection, maintenance fertilization, pest controls and weed chemicals, harvesting, storage, marketing and Farm Business Analysis, specialty crops, government programs and developing crop budgets.

**30-090-391 LIVESTOCK MANAGEMENT** ...livestock selection, breeding management, herd health, young stock management, selection, operation and maintenance of milking, feeding, ventilation and manure handling systems, farm buildings, feed storage and Farm Business Analysis.

**30-090-392 LIVESTOCK NUTRITION** ...nutritional terminology feeding management, economics of feeds, nutritional terminology requirements for maintenance, estimating feed consumption, feed tag labels for protein, energy, minerals and vitamins, evaluate feeding programs and metabolic diseases.

**30-090-393 SOIL MANAGEMENT** ...preparing and implementing a land use plan, soil testing procedures and reports, corrective fertilizers, soil conservation, tillage operations, nutrient management plan and implementations Farm Business business analysis.

**30-090-394 FARM BUSINESS OPERATION** ...farm organization, budgeting, cash flow, financial statements, record keeping systems, tax issues, business structure for farm operation, credit needs, Farm Business Analysis, farm safety, employee management, marketing plan.



# Financial Institutions Management

Program Code 101144

## Associate Degree

Offered at the Green Bay campus. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Financial Institutions Management is designed for current or prospective employees of financial institutions seeking specialized training.

### Program Outcomes

- Analyze business and consumer financial documents.
- Ensure compliance with state and federal laws.
- Recommend appropriate financial products to customers.
- Use personal financial planning techniques.
- Assess how economic policies and changes in the level of business activity affect the financial industry.
- Make loan decisions.
- Use an electronic word processing computer program.
- Use an electronic spreadsheet computer program.
- Contact customers regarding outstanding balances.
- Negotiate payment proposals with customers.
- Manage the work of other people in a team environment.
- Perform basic business math calculations.
- Deliver effective customer service.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math.
- Ability to use computer keyboard.

### Employment Potential

The curriculum is structured to provide a climate for the development of the functional skills needed by participants from entry-level through senior management.

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

**Customer Service Representative (CSR):** a primary contact person for customer services, identifies additional and appropriate financial services, guiding customers to the proper departments for specific products, and holds an influential position within a team environment.

**Personal Banker:** assists customers in opening accounts, explains bank services, and becomes involved in other financial institution services.

**Loan Officer:** processes and investigates applications for credit and makes decisions on loan applications.

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

- Commercial Banker
- Bank Officer

### Note

- The courses beginning with course numbers 10-114-xxx are delivered in an Accelerated Learning format. These courses have a compressed schedule. The competencies learned in an accelerated class are exactly the same as those in a traditional class. Students are expected to do most assignments outside of class time.
- Learners interested in double majoring in Accounting or Credit Business Management should consult with an instructor.
- Refer to the program website for information on accelerated learning and for helpful tips that will assist you in achieving the highest quality and most rewarding academic experience.
- Most credits from this degree can be transferred to some four-year colleges for learners interested in pursuing a bachelor's degree.

### Curriculum

The Financial Institutions Management Associate Degree is an accelerated program. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-132	Micro: Excel-Part 2	1
10-114-111	Credit-Consumer	4
10-114-151	Finance-Banking Principles	3
10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-102-150	Law-Business	3
10-114-125	Finance-Mortgage Lend/Serv	3
10-114-153	Finance-Personal	3
10-114-167	Finance-Commercial Lending	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>

#### Third Semester

10-101-110	Accounting 1	4
10-114-121	Credit-Management Practices	3
10-114-166	Credit-Collection Methods	3
10-114-180	Finance-Money/Banking	3
10-804-123	Math w Business Apps	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>19</b>

#### Fourth Semester

10-114-101	Credit-Business Applications	3
10-114-155	Finance-Trust Functions/Serv	3
10-114-170	Credit-Law	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
	Elective	2
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>67</b>

#### Suggested Electives:

Any course in the Credit Business Management or Accounting program.

This program is fully eligible for financial aid.

## Please Note

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- 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.*

**10-101-110 ACCOUNTING 1** ...accounting principles, financial statements, business transactions, accounting cycles/systems, specialized journals, accounting for cash and receivables for sole proprietorships in service or merchandising businesses.

**10-102-150 LAW-BUSINESS** ...common law contracts and sales contracts: formation, interpretation, performance, and discharge; the law of agency; corporations; and introduction to the American legal system: criminal and tort law, and global business issues.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ...advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

**10-114-101 CREDIT-BUSINESS APPLICATIONS** ...credit, sales, purchasing, shipping, receiving, accounts receivable, accounts payable, and collection procedures, prepare/analyze financial statements, use Excel to solve financial problems, amortization, breakeven, depreciation, gain/loss, and inventory. (Pre-requisite: 10-101-110, Accounting 1)

**10-114-111 CREDIT-CONSUMER** ...the role of consumer credit, loan processes, collections, financial advising and counseling; loan, promotion, and bank policies; consumer, commercial, mortgage loans, and credit cards.

**10-114-121 CREDIT-MANAGEMENT PRACTICES** ...manager's responsibilities/environment, planning, problem solving, organizational structure/cultures, staffing/human resources, leadership/teamwork, motivational techniques, communications, management controls, ineffective performers, and ethical business practices. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending, OR 10-104-117 or 10-114-117, Credit-Business)

**10-114-125 FINANCE-MORTGAGE LENDING/SERVICING** ...principles and practices involved in making and closing mortgage loans and servicing a sound mortgage portfolio, including the secondary mortgage market. (Prerequisite: 10-104-111, Credit-Consumer or 10-114-111, Credit-Consumer )

**10-114-151 FINANCE-BANKING PRINCIPLES** ...U.S. banking history, organization, the Federal Reserve System, deposit functions, security issues, payment flow, credit functions, accounting, specialized services, marketing, and current issues and trends.

**10-114-153 FINANCE-PERSONAL** ...income and occupations, financial spending plan development, purchasing consumer goods and services, risk management plan development, investment plan development, retirement and estate planning, and financial advising.

**10-114-155 FINANCE-TRUST FUNCTIONS/SERVICE** ...trust functions; estate settlement; guardianships; trust services; performance of agencies, individuals, business organizations, charitable institutions; and trust administration.

**10-114-166 CREDIT-COLLECTION METHODS** ...know your debtor, collection laws, pre-legal and legal methods used in collections, negotiating payment proposals, NSF checks, skip tracing, and bankruptcy. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending OR 10-104-117 or 10-114-117, Credit-Business)

**10-114-167 FINANCE-COMMERCIAL LENDING** ...functions of the loan interview and credit investigation, elements of the loan document and its loan functions, the structuring of commercial loans, and federal and state laws governing commercial lending. (Prerequisite: 10-104-111 OR 10-114-111 Credit-Consumer)

**10-114-170 CREDIT-LAW** ...Uniform Commercial Code, credit regulations, Wisconsin Consumer Protection Law, collection law, and bankruptcy. (Prerequisite: 10-102-167 or 10-114-167, Finance-Commercial Lending OR 10-104-117 or 10-114-117, Credit-Business)

**10-114-180 FINANCE-MONEY/BANKING** ...economics and banking, commercial banking system, money supply, investments and loans, Federal Reserve System, and international monetary system. (Prerequisite: 10-809-195, Economics)



# Fire Protection Engineering Technology

Program Code 105033

## Associate Degree

Offered at the Marinette campus.

For information: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Fire Protection Engineering Technology teaches students to design, install, and service automatic sprinkler, fire alarm, and special hazard fire suppression systems.

### Program Outcomes

- Analyze developments in the fire protection field.
- Produce fire protection drawings.
- Use written, technical, and oral presentations.
- Design fire protection systems.
- Use construction blueprints.
- Evaluate automatic sprinkler systems.
- Evaluate fire protection hazards.
- Troubleshoot electrical components of fire protection systems.
- Compare manual and automatic fire extinguishing systems and agents.
- Arrange fire detection, alarm, and control devices.
- Design automatic fire sprinkler systems.
- Test to NICET Level II in at least one subfield.
- Design special hazards systems.
- Observe how fire protection is viewed by the general public.
- Assemble systems cost information.
- Install, service, and inspect fire protections systems.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.
- High school background in mathematics, science, and technology education.

### Employment Potential

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

**Fire Protection Systems Designer:** prepares designs and layout drawings of new detection and suppression systems for commercial, residential, and industrial applications.

**Fire Protection Equipment Sales Representative:** merchandises fixed and portable fire protection equipment for commercial, industrial, and residential applications.

**Fire Protection Systems Installer:** interprets the protection system design for on-site installation, operation, and maintenance of fire protection systems.

**Industrial Safety Technician:** assists the industrial safety manager in plant fire safety programs and procedures; and ensures compliance with federal, state, and municipal codes and ordinances.

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

- Fire Protection Consultant
- Fire Protection Equipment Sales Manager
- Industrial Safety Manager
- Municipal Safety Manager
- Property Loss/Risk Management Specialist

\* Any three of the six NICET courses must be taken prior to graduation.

10-503-185	NICET Advanced Sprinklers 1, 1 credit
	— offered third semester
10-503-187	NICET Advanced Special Haz 1, 1 credit
	— offered third semester
10-503-186	NICET Advanced Sprinklers 2, 1 credit
	— offered fourth semester
10-503-188	NICET Advanced Special Haz 2, 1 credit
	— offered fourth semester
10-503-189	NICET Advanced Alarms 1, 1 credit
	— offered fourth semester
10-503-190	NICET Advanced Alarms 2, 1 credit
	— offered fourth semester

### Curriculum

The Fire Protection Engineering Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-503-114	Fire Protection Fundamentals	3
10-503-115	Fire Tech Prt Rdg/Sketching	3
10-503-136	Sprinkler Systems 1	2
10-606-115	CAD	3
10-801-196	Oral/Interpersonal Comm	3
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-503-120	Special Hazards Systems 1	3
10-503-126	Sprinkler Hydraulics-Auto	3
10-503-132	Fire Detection-Elec 1	3
10-503-137	Sprinkler Systems 2	4
10-503-180	Nicet-Basic	2
10-606-128	CAD-Fire Tech Advanced	1
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>19</b>

#### Third Semester

10-503-128	Fire Alarm System Design	2
10-503-129	Fire Alarm Systems Application	1
10-503-135	Fire Detection-Elec 2	3
10-503-138	Hazard Analysis	3
10-503-149	Sprinkler Systems 3	2
*10-503-1XX	NICET Advanced	1
	AND/OR	
*10-503-1XX	NICET Advanced	1
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-503-140	Special Hazards Systems 2	3
10-503-148	Technical Project	3
*10-503-1XX	NICET Advanced	1
	OR	
*10-503-1XX	NICET Advanced	1
	OR	
*10-503-1XX	NICET Advanced	1
	OR	
*10-503-1XX	NICET Advanced	1
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-503-114 FIRE PROTECTION FUNDAMENTALS

...combustion processes, fire detection technology, fire suppression technology, fire protection mathematics, historical fires, fire codes, building codes, contracts, bidding, liability, the domestic and international fire protection industry, and career opportunities.

### 10-503-115 FIRE PROTECTION BLUEPRINT

READING/SKETCHING ...reading floor plans, details, site plans, electrical, HVAC, plumbing and fire protection plans, performing and sketching site surveys for fire protection, preparing bill of materials, and interpreting specifications.

### 10-503-120 FIRE HAZARDS SYSTEMS 1-SPECIAL

...carbon dioxide systems, the phase out of Halon systems, clean agents, halocarbon systems, inert gas systems, dry chemical systems, wet chemical systems, foam systems, and explosion suppression systems.

### 10-503-126 SPRINKLER HYDRAULICS-AUTOMATIC

...hydraulic calculations for tree, loop, and grid systems using manual and computerized methods; and testing and evaluating water supplies for fire protection.

### 10-503-128 FIRE ALARM SYSTEM DESIGN

...the operating principles, selection and application of automatic fire detectors; proper location and spacing of detectors; the selection and use of notification appliances; and various types of fire alarm systems.

### 10-503-129 FIRE ALARM SYSTEMS APPLICATIONS

...the interconnection of automatic fire detectors, notification appliances and fire alarm panels; addressability of devices; programming of addressable fire alarm panels; and troubleshooting of addressable panels.

**10-503-132 FIRE DETECTION-ELECTRONICS 1** ...basic concepts of AC/DC electrical circuits, Ohm's Law, series/parallel resistance, conductors, insulators, batteries, and electro-mechanical induction used in fire protection.

### 10-503-135 FIRE DETECTION-ELECTRONICS 2

...electronic sensing and activating systems, detection, alarm and suppression systems, component parts, power sources, and testing and troubleshooting fire protection systems. (Prerequisite: 10-503-132, Fire Detection- Elec 1)

**10-503-136 SPRINKLER SYSTEMS 1** ...automatic fire sprinkler systems emphasizing types of sprinkler systems and their application, hazard classifications, automatic fire sprinkler system components, and sprinkler system design approaches.

**10-503-137 SPRINKLER SYSTEMS 2** ...fire protection requirements of automatic sprinkler systems, design pipe schedule and hydraulically calculated water suppression systems, foam systems, and fire pump selection. (Prerequisite: 10-503-136, Sprinkler Systems 1)

**10-503-138 HAZARD ANALYSIS** ...planning, surveying, and making professional recommendations regarding appropriate fire prevention, and suppression and detection systems for specified industrial fire hazards.

**10-503-140 SPECIAL HAZARDS SYSTEMS 2** ...the design of special hazard systems emphasizing total flooding and local application CO2 systems, inert gas and halocarbon clean agent systems. (Prerequisite: 10-503-120, Special Hazards Systems 1)

**10-503-148 TECHNICAL PROJECT** ...independent research report or project utilizing technical and communication skills from Fire Protection Engineering Technician program.

**10-503-149 SPRINKLER SYSTEMS 3** ...high piled storage, rack storage, extended coverage, residential, and water spray sprinkler system design utilizing computer design software; specifying supplemental water supplies for fire protection.

**10-503-180 NICET-BASIC** ...procedures, forms, standards, codes, and general knowledge necessary to successfully pass the crossover work elements in level 2 - NICET Certification in "Auto Sprinkler, Special Hazard, and Fire Alarm Systems Layouts."

**10-503-185 NICET ADVANCED SPRINKLERS 1** ...certification preparation for Level I and Level II NICET work elements in the subfield of Automatic Sprinkler System Layout.

**10-503-186 NICET ADVANCED SPRINKLERS 2** ...certification preparation for Level III and Level IV NICET work elements in the subfield of Automatic Sprinkler System Layout. (Prerequisite: 10-503-185, NICET Advanced Sprinklers 1)

**10-503-187 NICET ADVANCED SPECIAL HAZARDS 1** ...certification prepared for Level I and Level II NICET work elements in the subfield of Special Hazards Systems.

**10-503-188 NICET ADVANCED SPECIAL HAZARDS 2** ...certification preparation for Level III and Level IV NICET work elements in the subfield of Special Hazards Systems. (Prerequisite: 10-503-187, NICET Advanced Spec Haz 1)

**10-503-189 NICET ADVANCED ALARMS 1** ...certification preparation for Level I and Level II NICET work elements in the subfield of Fire Alarms.

**10-503-190 NICET ADVANCED ALARMS 2** ...certification preparation for Level III and Level IV NICET work elements in the subfield of Fire Alarms. (Prerequisite: 10-503-189 NICET Advanced Alarms 1)

### 10-606-115 CAD (COMPUTER AIDED DRAFTING)

...entry level computer-aided graphics with AutoCAD software; using basic and advanced drawing, display, editing, dimensioning, and plotting commands.

**10-606-128 CAD-FIRE TECH ADVANCED** ...advanced definition and use of: blocks, user coordinate systems, external references, attributes, and layouts for drawing and plotting; and drawing exchange procedures. (Prerequisite: 10-606-115, CAD)

# Gas Utility Construction and Service

Program Code 314692

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Gas Utility Construction and Service prepares students to install, maintain, and operate natural and propane gas distribution systems used to supply residential, commercial, and industrial customers.

### Program Outcomes

- Communicate technical information.
- Operate tools and equipment.
- Join pipe.
- Install propane gas distribution systems.
- Install natural gas distribution systems.
- Apply customer service skills.
- Maintain gas distribution systems.
- Operate pipeline excavation equipment.
- Service gas appliances.
- Opportunity to secure a commercial driver's license (CDL).

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Be able to obtain a commercial driver's license.
- Place satisfactorily in the NWTC mathematics examination.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Note

- Students receive a certificate from the Midwest Energy Association. This certificate is recognized throughout the United States.
- Students also receive selected Pipeline Operator qualifications as mandated by the Federal Office of Pipeline Safety.
- Students who have completed the Gas Utility Construction and Service technical diploma program have the opportunity to fulfill the requirements for a Utility Management certificate and/or apply these credits toward a Leadership Development and/or an Individualized Technical Studies associate degree.

### Employment Potential

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

**Propane Gas Delivery Person:** delivers bulk propane gas to customers and interacts with customers.

**New Customer Tank and Cylinder Installer:** installs propane and connects piping to customer appliances.

**Bulk Plant Operator:** fills and maintains cylinders and fills bulk delivery trucks.

**Gas Construction Mechanic:** installs and maintains gas distribution and transmission pipelines using trenching, backhoe, underground road boring, plastic fusion, welding, mapping, and record keeping skills.

**Gas Meter Mechanic:** installs, repairs, and maintains electronic and mechanical gas metering equipment.

**Gas Service Mechanic:** installs and maintains residential, commercial, and industrial gas piping, valving, pressure regulating, and overpressure protective equipment.

**Gas Clerk-Estimator:** develops specifications and related maps and records used in installing and maintaining gas distribution facilities. Records of this type are manual but are moving towards computer emphasis.

**Gas Regulator Maintenance Mechanic:** installs and maintains high pressure gas regulating, measuring, odorizing, heating, filtering, valving, and piping systems; electronically and mechanically operated equipment are involved.

**Gas Appliance Repair Mechanic:** maintains and troubleshoots residential and/or commercial gas appliances and heating/cooling equipment.

**Underground Facilities Locator:** locates and marks all underground facilities prior to excavation using various locating equipment.

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

- Construction Crew Foreman
- Corrosion Technician
- Meter and Regulator Technician
- Utility Locating Supervisor
- Pipeline Welder
- Vendor Sales and Marketing

### Curriculum

The Gas Utility Construction and Service Technical Diploma is a nine-month, three-semester program. Upon graduation, a student will have completed 33 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-110	Elem Algebra w Apps	3
31-442-315	Welding-Gas Service 1	2
31-469-310	Gas Utility Field Trng 1	4
<b>Semester Total</b>		<b>9</b>

#### Second Semester

31-413-348	Electricity-Basic	2
31-422-310	Metallurgy	2
31-442-325	Welding-Gas Service 2	2
31-469-320	Gas Utility Field Trng 2	5
31-469-330	Gas Utility Field Trng 3	5
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>17</b>

#### Third Semester

31-413-358	Electricity-Gas Applianc	2
31-469-340	Gas Utility Field Trng 4	4
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>7</b>
<b>Total Credits</b>		<b>33</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**31-413-348 ELECTRICITY-BASIC** ...electron theory, electrical terms, Ohm's Law, DC and AC circuits, magnetism and magnetic devices, electrical measurements, inductance and capacitance, relays and transformers, motors and generators, circuit protective devices, electrical safety. (Prerequisite: Accepted into Gas Utility Construction & Service)

**31-413-358 ELECTRICITY-GAS APPLIANCE** ...electrical sources/circuits in gas appliances, safe practices, test equipment, reading wiring diagrams, gas/electrical control functions, ignition systems, sequence of operation and troubleshooting. (Prerequisite: 31-413-348, Electricity Basic)

**31-422-310 METALLURGY** ...manufacture of iron and steel, mechanical and physical properties of metals, metal identification, macro and microscopic grain structures, welding metallurgy, applied heat treating processes, and weld failures and fractures.

**31-442-315 WELDING-GAS SERVICE 1** ...position pipe welding utilizing oxyacetylene and gas metal arc welding, welding safety, weld faults and causes, weld joint design, and fitup. (Prerequisite: Accepted into Gas Utility Construction & Service)

**31-442-325 WELDING-GAS SERVICE 2** ...position pipe welding utilizing gas metal arc welding and shielded metal arc welding processes, pipe fitup, and pipe weld testing according to API 1104 code. (Prerequisite: 31-442-315, Welding-Gas Service 1)

**31-469-310 GAS UTILITY FIELD TRAINING 1** ...construction equipment safety and operation (trenching, backhoe, boring), equipment maintenance, gas and vehicular safety, field mapping. (Prerequisite: Accepted into Gas Utility Construction & Service)

**31-469-320 GAS UTILITY FIELD TRAINING 2** ...natural gas line installation standards for plastic pressure testing, fusion, leak detection procedures, general installation procedures and repair of plastic mains and services, introduction to propane gas systems and safety. (Prerequisite: 31-469-310, Gas Utility Field Training 1)

### 31-469-330 GAS UTILITY FIELD TRAINING 3

...installation and repair of steel mains and services, applied field welding and maintenance, line testing and leak detection procedures, approved safety installation procedures using hand tools and supportive equipment. (Prerequisite: 31-469-320, Gas Utility Field Training 2)

### 31-469-340 GAS UTILITY FIELD TRAINING 4

...installation, maintenance, and repair of residential gas appliances, venting codes, line stoppering equipment, corrosion control, regulators, metering, first aid, and customer service training. (Prerequisite: 31-469-330, Gas Utility Field Training 3)





# General Studies Transfer (UW-Green Bay or UW-Oshkosh) Program Code 108001

Offered at the Green Bay, Marinette and Sturgeon Bay campuses.

For information in Green Bay: (920) 498-5444.

For information in Marinette: (715) 735-9361.

For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

## Program Description

The General Studies Transfer program includes a thirty-two credit core of courses designed to meet specific general education requirements at UW-Green Bay or UW-Oshkosh. Additional admission requirements and fees may apply.

## Program Outcome

Course completion will allow students to qualify for sophomore status at UW-Green Bay or UW-Oshkosh. Completers who have a 2.5 overall Grade Point Average may submit an application to either university.

## Requirements For Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).

## Note

- All requirements and fees for enrollment at UW-Green Bay or UW-Oshkosh will apply and are subject to change.
- For more information on UW-Green Bay, go to UW-Green Bay Admissions Office Web site: [www.uwgb.edu/admissions](http://www.uwgb.edu/admissions)
- For more information on UW-Oshkosh, go to UW-Oshkosh Admissions Office Web site: <http://admissions.uwosh.edu>
- If you did not successfully complete Algebra in high school you would be required to take Elementary Algebra 10-804-110 before taking Intermediate Algebra.

## Curriculum

The General Studies Transfer program is a 32 credit program. Please follow the curriculum list for your intended transfer school.

General Studies Transfer to UW-Green Bay		
Catalog No.	Description	Credits
10-801-136	English Composition 1	3
OR		
10-801-195	Written Communication	3
10-804-118	Interm Algebra w Apps	4
10-806-154	General Physics 1	4
OR		
10-806-134	General Chemistry	4
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
10-809-188	Developmental Psychology	3
10-809-195	Economics	3
10-809-196	Intro to Sociology	3
10-809-197	Contemporary Amer Society	3
10-809-198	Intro to Psychology	3
<b>Total Credits</b>		<b>32</b>

General Studies Transfer to UW-Oshkosh		
Catalog No.	Description	Credits
10-801-136	English Composition 1	3
OR		
10-801-195	Written Communication	3
10-801-197	Technical Reporting	3
10-801-198	Speech	3
10-804-118	Interm Algebra w Apps	4
10-806-154	General Physics 1	4
OR		
10-806-134	General Chemistry	4
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3

**Complete 3 courses (9 credits) in at least 2 areas from the following:**

### Area 1

10-809-159	Abnormal Psychology	3
OR		
10-809-188	Developmental Psychology	3

### Area 2

10-809-195	Economics	3
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### Area 3

10-809-196	Intro to Sociology	3
OR		
10-809-199	Psychology Of Human Relations	3
OR		
10-809-198	Intro to Psychology	3
OR		
10-809-197	Contemporary Amer Society	3
<b>Total Credits</b>		<b>32</b>

This program is fully eligible for financial aid.



## 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](http://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.*

**10-801-136 ENGLISH COMPOSITION 1** ...learners develop knowledge/skills in planning, organizing, writing, editing. Students will also analyze audience/purpose, use elements of research, format documents using standard guidelines, and develop critical reading skills.

**10-801-195 WRITTEN COMMUNICATION** ...the nature and scope of academic and business writing. Develops writing skills which include pre-writing, drafting, revising, and editing. A variety of writing assignments are designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents.

**10-801-197 TECHNICAL REPORTING** ...principles of report writing and correspondence, proposals, feasibility reports, progress reports, investigation reports, evaluation reports, meeting reports, memos, and correspondence. (Prerequisite: 10-801-195, Written Communication)

**10-801-198 SPEECH** ...fundamentals of effective oral presentation to small and large groups: topic selection, audience analysis, methods of organization, research, structuring evidence and support, delivery techniques, and the listening process.

**10-804-118 INTERM ALGEBRA WITH APPLICATIONS** ...Algebra content with applications. Topics include properties of real numbers, order of operations, algebraic solution for linear equations and inequalities, operations with polynomial and rational expressions, operations with rational exponents and radicals, algebra of inverse, logarithmic and exponential functions. (Prerequisites: Recommendations: TABE A: 11.0 GE Math or Accuplacer Arithmetic = 75 AND Accuplacer (College Level Math) = 50 OR Completion of 10-804-110, Elementary Algebra w Apps OR 10-804-120, Math-Tech Algebra with grade "C" or better).

**10-806-154 GENERAL PHYSICS 1** ...applications/theory of basic physics principles: problem-solving, laboratory investigation, and applications including unit conversion and analysis, vectors, translational and rotational kinematics/dynamics, heat/temperature, and harmonic motion and waves. (Prerequisite: Recommendation: 10-804-118, Intermediate Algebra with Apps with a grade of "C" or better)

**10-806-134 GENERAL CHEMISTRY** ...covers chemistry fundamentals. Topics: metric system, problem-solving, periodic relationships, chemical reactions, chemical equilibrium, properties of water; acids, bases, and salts; and gas laws. (Prerequisite: Recommendation: Completion of one year of High School Algebra with a "C" or better)

**10-809-159 ABNORMAL PSYCHOLOGY** ...surveys features, causes, assessment and treatment of abnormal behavior through major theoretical perspectives. Introduces the diagnosis system of the DSM-IV, the history, cultural/social differences, current perspectives, diagnosis criteria/treatments. (Prerequisite: Recommendation: Completion of 10-809-198, Introduction to Psychology)

**10-809-166 INTRO TO ETHICS: THEORY & APP** ...basic understanding of theoretical foundations of ethical thought; analyze/compare relevant issues using diverse ethical perspectives; critically evaluate individual, social/professional standards of behavior—applying a systematic decision-making process.

**10-809-172 RACE ETHNIC & DIVERSITY** ...basic American values of justice and equality by teaching vocabulary, history of immigration/conquest, transcultural communication, legal liability, multicultural majority/minority relations, ageism, sexism, gender, sexual orientation, the disabled/ADA. (Prerequisite: Recommendation: Completion of 10-809-196, Introduction to Sociology or 10-809-197, Contemporary American Society prior to this course).

**10-809-188 DEVELOPMENTAL PSYCHOLOGY** ...defines human development; examines theories; heredity and environmental effects; prenatal development and birth; evaluates biosocial, cognitive psychosocial development through the life span; aging, death, and dying.

**10-809-195 ECONOMICS** ...scarcity, resources, alternative economic systems, growth, supply and demand, monetary and fiscal policy, inflation, unemployment, and global economic issues.

**10-809-196 INTRODUCTION TO SOCIOLOGY** ...the nature and variety of groups; inequality, race and ethnicity; family, population, social integration, and change; collective behavior; politics, economics, religion, education, and the effects of technology.

**10-809-197 CONTEMPORARY AMER SOCIETY** ...the major social institutions within the American society: government, family, education, religion, and economic system.

**10-809-198 INTRODUCTION TO PSYCHOLOGY** ...survey of the theoretical foundations of human behavior such as sensation and perception, motivation, emotions, learning, personality, psychological disorders, therapy, stress, and human diversity in personal, social and vocational settings.

**10-809-199 PSYCHOLOGY OF HUMAN RELATIONS** ...decision making, motivation, conflict resolution, learning strategies, growth and adjustment, diversity, psychological theories, relationships, psychological disorders, stress, career analysis, social psychology, and lifespan development.

# Health Care Business Services

Program Code 101601

## Associate Degree

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Health Care Business Services prepares a student to work in the business office of medical and dental clinics, hospitals, nursing homes, related healthcare facilities, and health insurance settings in administrative, financial, and customer service roles.

Students who have an interest in the business and information aspects of healthcare, but are unsure of their preferences in this growing field, have a special opportunity to explore their options. The Health Information Technology and Health Care Business Services programs share many courses throughout the curriculum. This allows students to explore opportunities in both fields. This is a unique opportunity within the College.

### Program Outcomes

- Follow federal, state, and local laws and regulations.
- Identify marketing methods and benefits for health care facilities.
- Use service and managed care contracts.
- Process patient accounts receivables.
- Schedule patient appointments.
- Use medical terminology.
- Use ICD 9 and CPT 4 coding.
- Complete and process health insurance claim forms.
- Process medical records release and storage procedures.
- Identify components of the U.S. healthcare delivery system.
- Apply computer skills specific to health care and health insurance.
- Record accounting and financial transactions in a medical setting.
- Use a computer keyboard.
- Investigate effective telephone techniques.
- Explore components of the employment interview.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Flexible Learning Options

- The majority of Health Care Business Services program courses are offered on-line.
- The program may be completed in a part-time or full-time format.

### Employment Potential

A graduate of this program will have the potential for employment as:

- Admitting Representative
- Appointment Scheduler
- Claims Analyst
- Insurance Billing Specialist
- Medical Records Associate
- Patient Services Representative
- Patient Accounts Associate
- Provider Relations Associate
- Financial Counselor
- Medical and Insurance Customer Service Representative

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

- Clinic Office Supervisor or Manager
- Hospital Administrative Assistant
- Medical Credit Manager
- Nursing Home Administrator
- Nursing Home Administrative Assistant
- Patient Accounts Supervisor
- Health Insurance Supervisor/Trainer
- Certified Coding Specialist
- Health Insurance Provider Contract Analyst
- Physician Relations Administrator

### Internship

Students will be required to pay for liability insurance, provide their own transportation to internship sites, and cover any other expenses related to internship experiences. Students may be expected to travel distances to internships.

Students will be required to complete a TB test and Caregiver Background Check prior to their internship. Students may be required by the internship site to complete a physical examination and/or provide proof of immunizations prior to interning.

Students are required to petition for an internship assignment. Students may petition by submitting a "Petition to Enter Internship" form to the Health Sciences Department office according to the following schedule:

- Spring semester internship deadline is September 30.
- Fall semester internship deadline is February 28.

NWTC will make every effort to place students in the semester they request. However, NWTC cannot guarantee an internship site assignment in the semester being requested.

### Requirements For Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- Typing proficiency of 30 words per minute (mandatory preadmission typing test to be taken at the NWTC Assessment Center).

### Requirements for Program Entry

- It is strongly recommended that candidates meet the program Academic Skills Assessment benchmarks prior to beginning coursework, or achieve a score of 20 on ACT. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory spring program orientation.

### Curriculum

The Health Care Business Services Associate Degree is an on-line, two-year, four-semester program. Upon graduation, a student will have completed 65 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-111	Micro: Windows-Intro	1
10-103-121	Micro: Word-Intro	1
* 10-501-101	Medical Terminology	3
* 10-530-172	Healthcare Delivery Systems	2
* 10-530-176	Health Data Management	2
* 10-530-181	Intro to Health Record	1
10-801-195	Written Communication	3
* 10-806-189	Basic Anatomy	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-103-131	Micro: Excel-Intro	1
10-103-151	Micro: PowerPoint-Intro	1
* 10-160-161	Insurance Health Principles	3
* 10-530-155	Diagnostic/Procedure Coding	3
* 10-530-178	Healthcare Legal & Ethic Issue	2
10-801-196	Oral/Interpersonal Comm	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-101-106	Accounting-for Non-Accountants	3
10-103-141	Micro: Access-Intro	1
10-104-191	Customer Service Mgmt	3
* 10-160-143	Medical Practice Proc	3
* 10-160-151	Healthcare Relations	2
* 10-530-120	Medical Transcription	1
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

* 10-160-140	HCBS Internship	3
* 10-160-165	HCBS Organizational Resources	2
* 10-160-166	Medical Billing Processes	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>65</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

#### Note

- A candidate who does not meet the requirements for program entry should meet with an NWTC counselor to develop a learning plan to make up any deficiencies through testing or course work.
- It is recommended that students interested in pursuing a degree in Health Information Technology should take ICD-9-CM (10-530-183) and CPT Coding (10-530-184) in place of Diagnostic/Procedure Coding (10-530-155).

This program is fully eligible for financial aid.

## 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](http://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.*

**10-101-106 ACCOUNTING: INTRO FOR NON-ACCOUNTANTS** ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

**10-103-111 MICRO: WINDOWS-INTRODUCTION** ...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-160-140 HEALTHCARE BUSINESS SERVICES INTERNSHIP** ...career planning, resumes, interviews, search strategy, actual health care work experience, applied workplace improvements and ethical model. (Prerequisites: Accepted in the Health Care Business Services Program; 10-530-155, Diagnostic/Procedure Coding; Corequisite: 10-160-166, Medical Billing Processes)

**10-160-143 MEDICAL PRACTICE PROCEDURES** ...professional duties, medical scheduling, admissions, medical office software, 10-key, third-party payer processes, managed care procedures, empathy, diversity, medical records, confidentiality, information systems, regulation, office medical administration. (Prerequisite: 10-103-111, Micro: Windows Intro; 10-103-121, Micro: Word-Intro; 10-530-176, Health Data Management.)

**10-160-151 HEALTHCARE RELATIONS** ...financing of healthcare, managed care participants and products, integrated systems, organizational structure, provider networks, purchasers, cost containment, quality of care, regulation, and accountability. (Prerequisite: 10-160-161, Insurance Health Principles.)

**10-160-161 INSURANCE HEALTH PRINCIPLES** ...risk management, private health insurance, dental insurance, worker's compensation, malpractice issues, government plans: Medicare, Medicaid, Champus, TriCare, managed care, benefit plan design, provider contracts and insurance for health care facilities. (Corequisite: 10-530-172, Healthcare Delivery Systems.)

**10-160-165 HCBS ORGANIZATIONAL RESOURCES** ...a study of the principles of management to include planning, organizing, human resource management, directing, and controlling as related to the health information department. (Corequisite: 10-160-143, Medical Practice Procedures)

**10-160-166 MEDICAL BILLING PROCESSES** ...optimizing key billing and collection processes; breaking down the billing and collection process; granting credit in a medical facility; examine expected performance outcomes and advanced billing practices. (Prerequisites: 10-101-106, Accounting for Non-Accountants; 10-160-143, Medical Practice Procedures)

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-530-120 MEDICAL TRANSCRIPTION** ...transcription process for medical dictation in a health care facility; transcription techniques; practice transcribing physicians' dictated reports; and apply grammar, punctuation, spelling, and technical rules. (Prerequisites: 10-501-101, Medical Terminology; 10-103-121, Micro: Word Introduction)

**10-530-155 DIAGNOSTIC/PROCEDURE CODING** ...the International Classification of Diseases and Current Procedural Terminology with emphasis on coding skills, use of this classification system in health care settings, its application for statistical and reimbursement purposes. (Prerequisites: 10-501-101, Medical Terminology; 10-806-189, Basic Anatomy)

**10-530-172 HEALTHCARE DELIVERY SYSTEMS** ...examines the organization, financing, regulation, and delivery of health care services. Includes the study of healthcare professionals.

**10-530-176 HEALTH DATA MANAGEMENT** ...introduces the use and structure of health care data elements, data sets, data standards, their relationships to primary and secondary record systems and health information processing. (Corequisites: 10-530-181, Intro to Health Record; 10-530-172, Healthcare Delivery Systems.)

**10-530-178 HEALTHCARE LEGAL & ETHICAL ISSUES** ...examines regulations for the content, use, confidentiality, disclosure, and retention of health information. An overview of the legal system and ethical issues are addressed. (Prerequisite: 10-530-176, Health Data Management.)

**10-530-181 INTRO TO THE HEALTH RECORD** ...illustrate the flow of health information in various health care delivery systems and within the health information department; retrieve data from health records; professional ethics; confidentiality and security of information.



# Health Information Technology

Program Code 105301

## Associate Degree - Two Years

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

This field is where healthcare meets the cutting edge of technology! The Bureau of Labor Statistics cites health information as one of the fastest growing occupations in the U.S. Health Information Technicians contribute to the quality of care by collecting, analyzing, and reporting health care data. This requires knowledge of disease, treatments, computer systems, and organizational skills.

Students who have an interest in the business and information aspects of health care, but are unsure of their preferences in this growing field, have a special opportunity to explore their options. The Health Information Technology and Health Care Business Services programs share many courses throughout the curriculum. This allows students to explore opportunities in both fields. This is a unique opportunity within the College.

### Program Outcomes

- Adhere to health information requirements and standards.
- Utilize clinical classifications.
- Support data collection and reimbursement systems.
- Abstract health care data for analysis and presentation.
- Adhere to security, privacy and confidentiality policies.
- Use information technology systems to process health information.
- Apply organizational management techniques to improve efficiency of departmental functions and services.
- Model professional behavior, ethics, and appearance.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Professional Practice Experience

Students will be required to provide their own transportation to assigned sites, and cover any other expenses related to professional experiences. Students may be expected to travel distances to assigned sites.

Students will be required to complete a TB test, physical examination, and provide current immunization information three months prior to Professional Practice.

Students are required to petition for a professional practice assignment. Students may petition by submitting a "Petition to Enter Professional Practice" form to the Health Sciences Department office according to the following schedule:

- Spring semester Professional Practice deadline is September 30.
- Fall semester Professional Practice deadline is February 28.

NWTC will make every effort to place students in the semester they request. However, NWTC cannot guarantee an assignment in the semester being requested.

### Flexible Learning Option

- A majority of the Health Information Technology program courses are offered in an on-line format.
- This program may be completed in a part-time or full-time format.

### Employment Potential

A graduate of this program will have the potential for employment in the following settings: hospitals, clinics, nursing homes, mental health facilities, home health agencies, state and federal health agencies, and private industry as a (an):

- Coding Specialist
- Release of Information Specialist
- Health Information Technician
- Insurance/Business Specialist
- Reimbursement Coordinator
- Data Quality & Integrity Monitor
- Privacy and/or Security Officer
- Data Analyst
- HIM Supervisor
- Cancer Registrar

### Accreditation

The Health Information Technology program is accredited by the Commission on the Accreditation for Health Informatics and Information Management Education in cooperation with the Council on Accreditation of the American Health Information Management Association, 233 N Michigan Avenue, Suite 2150 Chicago, IL 60601-5800, Phone: (312) 233-1131.

### Board/Certification Examinations

Graduates of the program are eligible to take the national accreditation examination offered by the American Health Information Management Association (AHIMA) to become a Registered Health Information Technician (RHIT).

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- One year of Biology, or equivalent, with a grade of "C" or better. If in high school, "C" in two semesters.
- Typing proficiency of 30 words per minute (mandatory preadmission typing test to be taken at the NWTC Assessment Center).

### Requirements for Program Entry

- It is strongly recommended that candidates meet the program Academic Skills Assessment benchmarks prior to beginning coursework, or achieve a score of 20 on the ACT. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory spring program orientation.
- Submit Caregiver Background Check paperwork.

### Note

- A candidate who does not meet the requirements for program entry should meet with an NWTC counselor to develop a learning plan to make up any deficiencies through testing or course work.
- Students considering going on to a 4-year HIA Degree or Cancer Registrar Certification should consider taking General Anatomy & Physiology in place of Basic Anatomy.

### Curriculum

The Health Information Technology Associate Degree is a two-year, four-semester program.

Upon graduation, a student will have completed 64 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-111	Micro: Windows-Intro	1
10-103-121	Micro: Word-Intro	1
* 10-501-101	Medical Terminology	3
* 10-530-172	Healthcare Delivery Systems	2
* 10-530-176	Health Data Management	2
* 10-530-181	Intro to Health Record	1
10-801-195	Written Communication	3
* 10-806-189	Basic Anatomy	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-103-131	Micro: Excel-Intro	1
10-103-141	Micro: Access-Intro	1
10-103-151	Micro: PowerPoint-Intro	1
* 10-530-178	Healthcare Legal & Ethic Issue	2
* 10-530-182	Human Diseases for Hlth Prof	3
* 10-530-183	ICD-9-CM-Coding	3
10-801-196	Oral/Interpersonal Comm	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

* 10-530-177	Healthcare Stats & Research	2
* 10-530-184	CPT Coding	3
* 10-530-185	Healthcare Reimbursement	2
* 10-530-190	Healthcare Info Systems	3
* 10-530-196	HIT-Professional Practice 1	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

* 10-530-193	Healthcare Quality Mgmt	2
* 10-530-194	HIM Organizational Resource	2
* 10-530-195	Applied Coding	2
* 10-530-198	HIT-Professional Practice 2	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>64</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

- The following courses are offered only in the Fall semester and in person:  
10-530-177, Healthcare Stats & Research  
10-530-190, Healthcare Info Systems  
10-530-196, HIT-Professional Practice 1
- The following courses are offered only in the Spring semester and in person:  
10-530-193, Healthcare Quality Management  
10-530-198, HIT-Professional Practice 2

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-103-111 MICRO: WINDOWS-INTRODUCTION

...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-530-172 HEALTHCARE DELIVERY SYSTEMS** ...examines the organization, financing, regulation, and delivery of health care services. Includes the study of healthcare professionals.

### 10-530-176 HEALTH DATA MANAGEMENT

...introduces the use and structure of health care data elements, data sets, data standards, their relationships to primary and secondary record systems and health information processing. (Corequisites: 10-530-181, Intro to Health Record; 10-530-172, Healthcare Delivery Systems.)

### 10-530-177 HEALTHCARE STATISTICS & RESEARCH

...explores the management of medical data for statistical purposes. Focuses on descriptive statistics, including definitions, collection, calculation, compilation, and display of numerical data. Vital statistics, registries, and research are examined. (Prerequisite: 10-530-176, Health Data Management.)

### 10-530-178 HEALTHCARE LEGAL & ETHICAL ISSUES

...examines regulations for the content, use, confidentiality, disclosure, and retention of health information. An overview of the legal system and ethical issues are addressed. (Prerequisite: 10-530-176, Health Data Management.)

**10-530-181 INTRO TO THE HEALTH RECORD** ...illustrate the flow of health information in various health care delivery systems and within the health information department; retrieve data from health records; professional ethics; confidentiality and security of information.

### 10-530-182 HUMAN DISEASES FOR THE HEALTH PROFESSION

...this course focuses on the common diseases of each body system as encountered in all types of health care settings by health information professionals. Emphasis is placed on understanding the etiology (cause), signs and symptoms, diagnostic tests, and treatment (including pharmacologic) of each disease. (Prerequisite: 10-501-101, Medical Terminology; 10-806-189, Basic Anatomy)

**10-530-183 ICD-9-CM-CODING** ...assign ICD-9-CM codes supported by medical documentation at entry level; apply ICD-9-CM instructional notations, conventions, rules, and official coding guidelines; case studies and actual medical record documentation. (Prerequisites: 10-501-101, Medical Terminology; 10-806-189, Basic Anatomy; Corequisites: 10-530-181, Intro to Health Records; 10-530-182, Human Diseases for Health Professions)

**10-530-184 CPT CODING** ...assign CPT codes supported by medical documentation at entry level; apply CPT instructional notations, conventions, rules, and official coding guidelines; case studies and actual medical record documentation. (Prerequisites: 10-501-101, Medical Terminology; 10-806-189, Basic Anatomy; 10-530-182, Human Diseases for Health Professions; Corequisite: 10-530-181, Intro to Health Records)

**10-530-185 HEALTHCARE REIMBURSEMENT** ...compare and contrast health care payers, illustrate the reimbursement cycle, comply with regulations for fraud and abuse. Assign Diagnosis Related Groups, Ambulatory Payment Classifications, and Resource Utilization Groups at entry-level. (Prerequisites: 10-501-101, Medical Terminology; 10-530-182, Human Diseases for Health Professions; 10-530-183, ICD-9-CM Coding; 10-806-189, Basic Anatomy; Corequisites: 10-530-181, Intro to Health Records; 10-530-184, CPT Coding)

### 10-530-190 HEALTHCARE INFORMATION SYSTEMS

...emphasizes the role of information technology in healthcare through an investigation of the electronic health record, business, and health information software applications. Assist in information systems design and implementation. (Prerequisites: 10-530-176, Health Data Management; 10-103-121, Micro: Word-Intro; Micro: Access-Intro; 10-103-131, Micro: Excel-Intro; 10-103-151, Micro: Powerpoint-Intro; 10-103-111 Micro: Windows-Intro)

### 10-530-193 HEALTHCARE QUALITY MANAGEMENT

...addresses regulatory requirements as related to quality improvement, utilization (case) management, risk management, and medical staff credentialing through the use of quality improvement methodologies and tools. (Prerequisite: 10-530-177, Healthcare Statistics & Research.)

### 10-530-194 HIM ORGANIZATIONAL RESOURCES

...a study of the principles of management to include planning, organizing, human resource management, directing, and controlling as related to the health information department. (Corequisite: 10-530-193, Healthcare Quality Management.)

**10-530-195 APPLIED CODING** ...assign ICD and CPT/HCPCS codes supported by medical documentation at intermediate level. Prepare appropriate physician queries in accordance with compliance guidelines and will assign codes to optimize appropriate reimbursement. (Prerequisites: 10-530-183, ICD-9-CM Coding; 10-530-184, CPT Coding; 10-530-185, Healthcare Reimbursement)

### 10-530-196 HIT-PROFESSIONAL PRACTICE EXPERIENCE 1

...this supervised clinical provides application of previously acquired skills and knowledge with experiences in the technical procedures of health record systems in a health care facility, discussion of clinical situations. (Prerequisites: 10-530-178, Healthcare Legal & Ethical Issues; 10-530-183, ICD-9-CM Coding; Corequisites: 10-530-177, Healthcare Statistics & Research; 10-530-184, CPT Coding)

### 10-530-198 PROFESSIONAL PRACTICE EXPERIENCE 2

...this supervised clinical provides application of previously acquired skills and knowledge, discussion of clinical situations, preparation for the certification examination and pre-graduation activities. (Prerequisites: 10-530-196, HIT-Professional Practice 1; 10-530-190, Healthcare Information Systems; Corequisites: 10-530-193, Healthcare Quality Management; 10-530-195, Applied Coding; 10-530-194 HIM Organizational Resources)

# Heating, Ventilation, Air Conditioning, and Refrigeration Technology

## Associate Degree

Program Code 106011

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Heating, Ventilation, Air Conditioning, and Refrigeration Technology prepares students to work with the control of air in respect to its heating, cooling, humidity, and cleanliness. Students will be able to install, service, troubleshoot, and repair HVAC/R systems.

### Program Outcomes

- Startup, service and repair HVAC/R systems.
- Troubleshoot HVAC/R systems.
- Develop, wire, and troubleshoot HVAC/R control circuits.
- Perform HVAC/R performance tests.
- Design and install HVAC/R piping systems.
- Evaluate airflow systems for new and existing applications.
- Determine heating and cooling demand requirements.
- Select heating and cooling equipment and auxiliary components.
- Safely utilize industry standard tools, meters, and test instruments.
- Communicate and document detailed service reports effectively.
- Prepare for EPA Refrigerant Handling Exam.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school algebra or equivalent.
- Students should have mastered high school Algebra and basic math skills. For a description of Algebra and basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Mechanical Contractor HVAC/R Technician:** installs, services, troubleshoots, and repairs HVAC/R systems at a customer's job site.

**Facilities Maintenance HVAC/R Technician:** installs, services, troubleshoots, and repairs HVAC/R systems as part of a maintenance staff.

**HVAC/R Equipment Manufacturer Technician:** assists service companies in locating, repairing, and preventing factory defects and service problems.

**Wholesale Service Representative:** assists HVAC/R contractors with the selection, application, and procurement of HVAC/R equipment.

**Commercial HVAC/R Systems:** works with the HVAC/R systems used in commercial applications such as office buildings, schools, stores, supermarkets, and restaurants. Duties include, but not limited to, installing, servicing, troubleshooting, and repairing walk-in coolers/freezers; reach-in coolers/freezers; ice makers; large air conditioning, heating, and air distribution systems; hydronic, steam, and forced air heating systems; roof top HVAC/R systems; and digital building automation control systems.

**Industrial HVAC/R Systems:** works with HVAC/R systems used in an industrial setting such as manufacturing, processing, and packaging plants. Duties include, but not limited to, installing, servicing, troubleshooting, and repairing large HVAC/R equipment used in the manufacturing process, such as drive-in coolers/freezers, process chillers and boilers, dust collection systems, plant air conditioning and heating, digital control of process, and building HVAC/R equipment.

**Residential HVAC/R Systems:** require the Technician to work with HVAC/R systems used in the home. Duties would include, but not limited to, installing, servicing, troubleshooting, and repairing refrigerator/freezers, central air conditioning system operating controls.

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

- HVAC/R Business Owner
- Energy Management Technician
- Engineering Assistant for HVAC/R Systems

### Curriculum

Heating, Ventilation, Air Conditioning, and Refrigeration Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits

#### First Semester

Catalog No.	Description	Credits
10-601-111	HVAC/R Electrical Fundamentals	3
10-601-112	HVAC/R Mechanical Service Fund	4
10-601-133	HVAC/R Refrigeration Fund	3
10-606-112	Engineering Applications	1
OR		
10-103-111	Micro: Windows-Intro	1
OR		
10-103-121	Micro: Word-Intro	1
OR		
10-103-122	Micro: Word-Part 2	1
OR		
10-103-131	Micro: Excel-Intro	1
OR		
10-103-132	Micro: Excel-Part 2	1
OR		
10-103-141	Micro: Access-Intro	1
OR		
10-103-142	Micro: Access-Part 2	1
OR		
10-103-151	Micro: PowerPoint-Intro	1
OR		
10-103-160	Micro: Outlook	1
10-804-110	Elem Algebra w Apps	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-601-113	HVAC/R Refrig/Air Cond Syst	3
10-601-121	HVAC/R Heating Fundamentals	3
10-601-127	HVAC/R Control Circuits	3
10-601-128	HVAC/R Heating Systems	3
10-614-129	Architectural Mech Systems	3
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-601-131	HVAC/R Heating System Applic	3
10-601-132	HVAC/R Air Conditioning Applic	3
10-601-147	HVAC/R Motor Control Appl	3
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-601-135	HVAC/R Hydronic System Applic	3
10-601-141	HVAC/R Systems Service	3
10-601-143	HVAC/R Refrigeration Appl	3
10-601-145	HVAC/R Control System Applic	3
10-801-196	Oral/Interpersonal Comm	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

## 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](http://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.*

**10-103-111 MICRO: WINDOWS-INTRODUCTION** ...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-122 MICRO: WORD-PART 2** ...advanced word processing features including working with headers/footers, inserting quick parts, themes, styles, sort and select; text flow; footnotes/endnotes, images, shapes, shared documents; specialized tables and indexes; forms; and sharing data. Requires strong introductory Word skills or Word-Intro.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ...advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-142 MICRO: ACCESS-PART 2** ...creating advanced queries, custom forms, multi-page forms, custom reports with grouping and calculations, integrating, embedding charts, data access pages, pivot tables, pivot charts, labels, and hyperlinks. Requires strong introductory Access skills.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-103-160 MICRO: OUTLOOK** ...use email, distribution lists, signatures, attachments, and task lists; schedule appointments and meetings using the calendar; flag, filter, sort, and merge contacts, use message delivery options; archive messages and folders.

**10-601-111 HVAC/R ELECTRICAL FUNDAMENTALS** ...AC and DC electricity, application of Ohm's Law principles to circuits, electrical power supplies, wiring materials, meter operation, test and troubleshoot switching circuits using industry standard meters and techniques. (Prerequisite: Accepted into HVAC Tech Program)

**10-601-112 HVAC/R MECHANICAL SERVICE FUNDAMENTALS** ...mechanical service fundamentals, basic sheet metal practices, proper tool usage procedures, ferrous metal piping procedures, brazing, soldering, copper piping practices, basic HVAC/R mechanical service repair/replacement procedures. (Prerequisite: Accepted into HVAC Tech Program)

**10-601-113 HVAC/R REFRIGERATION/AIR CONDITIONING SYSTEMS** ...residential/light commercial refrigeration and air conditioning system analysis, start-up, service, repair and troubleshooting using industry standard tools and techniques, evacuation, recovery, charging techniques, Federal certification preparation. (Corequisites: 10-601-121, HVAC/R Heating Fundamentals and 10-601-127, HVAC/R Control Circuits)

**10-601-121 HVAC/R HEATING FUNDAMENTALS** ...principles of combustion for fossil fuels, burner set-up, heating system basics, combustion testing for residential systems, and basic mechanical heating service. (Prerequisites: 10-601-111, HVAC/R Electrical Fundamentals; 10-601-133, HVAC/R Refrigeration & AC Fundamentals; 10-601-112, HVAC/R Mech Service Fund; Corequisite: 10-601-127, HVAC/R Control Circuits)

**10-601-127 HVAC/R CONTROL CIRCUITS** ...relay and HVAC/R electrical control circuit schematic development and analysis; wiring, testing and troubleshooting relay and HVAC/R control circuits; diagnose common HVAC/R system problems by analyzing the control circuit. (Prerequisites: 10-601-111, HVAC/R Electrical Fundamentals; 10-601-133, HVAC/R Refrigeration & AC Fundamentals; 10-601-112, HVAC/R Mechanical Service Fund; Corequisite 10-601-121, HVAC/R Heating Fundamentals)

**10-601-128 HVAC/R HEATING SYSTEMS** ...heating controls, heating control circuit basics, analysis of electrical controls for fossil fuel systems, wiring, start-up and service of residential furnaces. (Corequisites: 10-601-121, HVAC/R Heating Fundamentals; 10-601-127, HVAC/R Control Circuits)

**10-601-131 HVAC/R HEATING SYSTEM APPLICATIONS** ...interpreting control system diagrams, control circuit analysis, service and troubleshooting residential and commercial fossil fuel heating systems, rooftops and split systems. (Corequisite: 10-601-132, HVAC/R Air Conditioning Applic)

**10-601-132 HVAC/R AIR CONDITIONING APPLICATIONS** ...air properties, air system component application fundamentals, indoor air quality fundamentals, system measurement, adjustment, and troubleshooting to control temperature and humidity in HVAC systems. (Prerequisites: 10-601-113, HVAC/R Refrig/Air Cond Syst; 10-601-128, HVAC/R Heating Systems; Corequisite: 10-601-147, HVAC/R Motor Control Appl)

**10-601-133 HVAC/R REFRIGERATION FUNDAMENTALS** ...principles of refrigeration and air conditioning, temperature, heat and pressure measurement, system component operation, testing for proper system operation using industry standard tools and practices. (Prerequisite: Accepted into HVAC Tech program)

**10-601-135 HVAC/R HYDRONIC SYSTEM APPLICATIONS** ...hydronic fundamentals, piping systems, pipe sizing, boiler applications, system design fundamentals, system piping installation for conventional systems, radiant systems, and forced air systems, system component operation, selection service and troubleshooting. (Prerequisites: 10-601-131, HVAC/R Heating Systems Applications; 10-601-147, HVAC/R Motor/Control Applications; 10-601-132, HVAC/R Air Conditioning Applic)

**10-601-141 HVAC/R SYSTEMS SERVICE** ...analyze, set up, and troubleshoot three-phase motor starting systems, damper actuators, and economizers; advanced service and troubleshooting of commercial HVAC/R systems including rooftops, and split systems. (Corequisites: 10-601-143, HVAC/R Refrigeration Applications; 10-601-135, HVAC/R Hydronic System Applic)

**10-601-143 HVAC/R REFRIGERATION APPLICATIONS** ...refrigeration system piping, load calculation, sizing, and component selection; service, troubleshoot and repair commercial refrigeration systems including walk-in coolers/freezers, reach-in coolers/freezers and ice machines. (Prerequisites: 10-601-131, Heating System Applications; 10-601-147, HVAC/R Motor/Control Applications; 10-601-132, HVAC/R Air Conditioning Applications)

**10-601-145 HVAC/R CONTROL SYSTEM APPLICATIONS** ...HVAC/R electric, electronic, pneumatic, and computerized control systems for hydronic and air systems. Control application fundamentals, system wiring, start-up and troubleshooting. (Corequisites: 10-601-135, HVAC/R Hydronic System Applications; 10-601-143, HVAC/R Refrigeration Appl)

**10-601-147 HVAC/R MOTOR CONTROL APPLICATIONS** ...analyze and troubleshoot single-phase AC induction motors and motor starting components used in the HVAC/R industry with an emphasis on refrigeration/air conditioning compressor motors and components. (Prerequisites: 10-601-113, HVAC/R Refrig/Air Cond Syst; 10-601-128, HVAC/R Heating Systems)

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

**10-614-129 ARCHITECTURAL MECHANICAL SYSTEMS** ...basic math procedures, measurement, architect's scale, pictorial drawings, freehand sketching, alphabet of lines, orthographic projection, working drawings, plans, elevations, title block, drawing conventions, building materials, specifications, codes, and building systems.



# Hotel and Restaurant Management

Program Code 101092

## Associate Degree

Offered at the Green Bay and Sturgeon Bay campuses.

For information in Green Bay: (920) 498-5444. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Hotel and Restaurant Management prepares students for a variety of mid-management positions in lodging operations, food service operations, and tourism services. The program is grounded in experiential learning and involves extensive internship requirements.

### Program Outcomes

- Develop a personal career plan in the hospitality industry.
- Maximize profits in the lodging and food service industry.
- Plan a conference plan or special event.
- Manage cleaning and sanitation operations in the food service and lodging industry.
- Maximize facility productivity.
- Understanding preventative maintenance and equipment service.
- Manage quality customer service systems.
- Apply product presentation principles in the hospitality industry.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

Tourism is Wisconsin's fastest-growing industry and there are many interesting and challenging opportunities for relocating to work throughout Wisconsin, the Midwest, and the United States.

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

**Front Office Manager:** coordinates the reception and control center for servicing guests, directs and supervises front office staff, and maximizes room revenue through room inventory control.

**Convention Service Manager:** coordinates activities of staff and convention personnel to make arrangements for group meetings and conventions held in a hotel or convention facility.

**Food Service Manager:** coordinates food service activities of a hotel/restaurant or similar establishment, plans food service activities, schedules employees, oversees service, and controls costs.

**Executive Housekeeper:** supervises housekeeping employees, trains new hires, requisitions supplies, controls inventory, and inspects personnel work assignments.

**Sales Manager:** plans and administers sales programs to generate sales in a hotel or tourism organization, organizes prospect files, plans and prepares advertising and promotional materials, and arranges for publicity.

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

- General Manager
- Marketing Director
- Restaurant Manager
- Catering Manager

### Curriculum

The Hotel and Restaurant Management Associate Degree is a two-year program. Upon graduation, students will have completed 66 credits.

#### First Semester

Catalog No.	Description	Credits
10-102-158	Business-Intro	3
* 10-103-121	Micro: Word-Intro	1
* 10-103-141	Micro: Access-Intro	1
* 10-103-151	Micro: PowerPoint-Intro	1
* 10-101-190	Accounting-QuickBooks	1
* 10-103-131	Micro: Excel-Intro	1
* 10-111-103	Graphic Workstations	1
10-109-114	Front Office Management	3
10-801-195	Written Communication	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>15</b>

#### Second Semester

10-104-101	Selling Principles	3
10-104-191	Customer Service Mgmt	3
10-109-126	Food/Lodging Cost Control	3
10-801-198	Speech	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>

#### Third Semester

10-102-160	Global Business Mgmt	3
10-104-110	Marketing Principles	3
10-104-119	E-Business Web Marketing	3
10-109-127	Housekeeping/Facilities Mgmt	3
10-145-177	Entrepreneurship	3
OR		
10-196-145	Workplace Innovation	3
10-809-103	Think Critically & Creatively	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-102-150	Law-Business	3
10-104-125	Event Marketing	3
10-109-165	Hospitality Tourism-Intern	3
OR		
10-109-181	Hospitality/Tourism-FS	3
10-109-168	Beverage/Dining Room Mgmt	3
10-809-172	Race Ethnic & Diversity	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>66</b>

\* Any three of the six computer courses must be taken.

This program is fully eligible for financial aid.

## 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](http://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.*

**10-101-190 ACCOUNTING-QUICKBOOKS** ...an introductory course in using QuickBooks to create vendor/employee accounts, invoices, budgets, profit/loss statements, balance sheets, A/R, A/P, journals, graphs.

**10-102-150 LAW-BUSINESS** ...common law contracts and sales contracts: formation, interpretation, performance, and discharge; the law of agency; corporations; and introduction to the American legal system: criminal and tort law, and global business issues.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-102-160 GLOBAL BUSINESS MANAGEMENT** ...globalization, cultural environment, global trade environment, politics and law, economic integration, global trade and investment theories, exporting, global marketing, and global supply chain.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-104-101 SELLING PRINCIPLES** ...selling as a career; success factors in selling; personality development; product knowledge; and the sales process involving preparation, approach, presentation-demonstration, handling objections, and closing the sale successfully.

**10-104-110 MARKETING PRINCIPLES** ...marketing management, market segmentation, market research, consumer behavior, product decisions and management of distribution, pricing, promotional decisions for strategy planning.

**10-104-119 E-BUSINESS WEB MARKETING** ...traditional and electronic direct marketing strategies; methods include search engine management, direct marketing planning, database marketing, catalogs, telemarketing services, print, radio, television and direct mailing. (Prerequisite: 10-104-110, Marketing Principles)

**10-104-125 EVENT MARKETING** ...planning, promotion execution, and evaluation of special events (entertainment, industry, meeting/convention). Students will work toward the actual staging of an event (will require time outside of the classroom setting).

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-109-114 FRONT OFFICE MANAGEMENT** ...lodging classification, ownership/affiliation, hotel/front office organization, equipment, reservations, registration, guest services, guest accounting, credit monitoring, check-out/settlement, night audit, management functions, room statistics, yield management, staffing.

**10-109-126 FOOD/LODGING COST CONTROL** ...purchasing/receiving controls, storing/issuing controls, production controls, monitoring activities, sales controls, beverage controls, labor controls.

**10-109-127 HOUSEKEEPING/FACILITIES MGMT** ...staffing housekeeping operations, facilities safety and security, cleaning routines, material selection, laundry operations, controlling costs in housekeeping and maintenance departments, facility systems.

**10-109-165 HOSPITALITY TOURISM-INTERNSHIP** ...planning and preparation, career advancement plan, locating an internship provider, work habits, job performance, job evaluation, progress reporting, networking, final report, program evaluation.

**10-109-168 BEVERAGE/DINING ROOM MANAGEMENT** ...food/beverage industry, product classifications, responsible service; bar/kitchen equipment/organization; maintaining clean/sanitary facilities; staffing, training, supervising food/beverage employees; promotions planning; budgeting/cost controls of food/beverage operations.

**10-109-181 HOSPITALITY/TOURISM-FIELD STUDY** ...alternative to the internship: in-depth study of an industry, business, career or project.

**10-111-103 GRAPHIC WORKSTATIONS** ...explore the Macintosh Operating System and applications including iPhoto, iTunes, iMovie, GarageBand, FontBook, Sherlock, iCal, AddressBook and Dashboard. Learn to navigate the Mac Operating System and manage files and folders.

**10-145-177 ENTREPRENEURSHIP** ...entrepreneurship, success and failure, getting started: sources of capital, location, layout, and legal forms of organization, managing and operating, planning and organizing, directing and monitoring performance, marketing strategy, and administration.

**10-196-145 WORKPLACE INNOVATION** ...use of inventive thinking techniques and innovative methods to improve work processes in multiple workplace environments; research and analyze the use of technology in businesses to promote innovation in the workplace; and develop an innovative, entrepreneurial, and intrapreneurial mindset.

# Individualized Technical Studies

Program Code 108251

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Individualized Technical Studies program is intended for currently employed individuals who have a specific career objective that cannot be met by existing degree programs. By combining state board approved courses from two or more major areas of study, the student, along with an occupational advisor, designs an occupational degree program into a unique associate degree.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Completion of all recommended activities to address math and reading skills deficiencies.

### Employment Potential

With the growth of employment opportunities in small and mid-sized firms, employers increasingly seek workers able to take on multiple tasks and roles that cut across traditional occupational categories. With the introduction of new kinds of technologies and work processes, occupational duties and the competencies needed in the workplace are constantly in flux.

To be productive and effective in today's workplace, workers may need skills and knowledge drawn from a variety of traditional disciplines.

This program allows students to design a customized instructional program leading to an Associate of Applied Science Degree in Technical Studies. The individualized program will have a specific occupational focus designed by the student in consultation with an occupational mentor, district faculty, and career advising staff.

The program requires the identification of an occupation advisor who will assist the student in specifying skill competencies and occupational outcomes for a specific occupational area.

### Individualized Technical Studies Associate Degree Has Two Objectives:

- Provide flexibility in programming in order to meet the educational needs of individuals based on their particular career goals.
- Emphasize an individual's career goals that cannot be achieved through enrollment in any single instructional program currently available at the college.

As part of the educational process, each student is required to complete a personal program portfolio outlining his or her career objectives and the courses required to meet those objectives. This student portfolio, together with a completed application for admission, becomes part of the review process used by the NWTC Individualized Technical Studies committee to admit the student for a customized technical studies program.

### Curriculum

Total credits for the Individualized Technical Studies program will vary with a minimum of 60 credits.

Catalog No.	Description	Credits
10-801-195	Written Communication	3
10-801-198	Speech	3
10-804-123	Math w Business Apps	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-196	Intro to Sociology	3
10-809-198	Intro to Psychology	3
10-999-939	Technical Studies	39
<b>Semester Total</b>		<b>60</b>
<b>Total Credits</b>		<b>60</b>

This program is fully eligible for financial aid.



### 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](http://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.

## Explore the possibility of Individual Technical Studies in areas such as:

### Childcare Administration

Students who complete the 18-credit Child Care Administration Certificate may wish to combine those classes with other classes in the Early Childhood or Supervision associate degree programs for an Individual Technical Studies-Child Care Administration Degree. Courses can be chosen to create a customized curriculum specific to the needs of the individual, with an emphasis on Administration, Special Needs, Infant/Toddler or other areas.

### Entrepreneurship

In today's world, there is increasing desire among people of all ages to explore, develop, start and run their own businesses. But the knowledge, skills and abilities to start and successfully operate these businesses have never required the wearing of so many hats – and to wear them well. Though the rewards are great, the risks are equally as great, thereby requiring that today's entrepreneurs be more sophisticated and balanced in their planning and preparation. NWTC has carefully considered the needs of an entrepreneur, and have created four distinct Entrepreneurship Certificate tracks to consider. By pairing these certificates with general studies courses, you can create an Individualized Technical Studies Degree in Entrepreneurship.

For more information about these degrees and other exciting opportunities, please call (920) 498-5444 or (920) 498-6872.

### Course Descriptions

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

**10-801-195 WRITTEN COMMUNICATION** ...the nature and scope of academic and business writing. Develops writing skills which include pre-writing, drafting, revising, and editing. A variety of writing assignments are designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents.

**10-801-198 SPEECH** ...fundamentals of effective oral presentation to small and large groups: topic selection, audience analysis, methods of organization, research, structuring evidence and support, delivery techniques, and the listening process.

**10-804-123 MATH W BUSINESS APPS** ...real numbers; basic operations; proportions/one variable; percents, simple/compound interest; annuity; apply math concepts to purchasing/buying process, selling process; and basic statistics with business/consumer applications. (Prerequisite: Recommendation: TABE Level A: 9.8 GE Math or Accuplacer Arithmetic = 55).

**10-809-172 RACE ETHNIC & DIVERSITY** ...basic American values of justice and equality by teaching vocabulary, history of immigration/conquest, transcultural communication, legal liability, multicultural majority/minority relations, ageism, sexism, gender, sexual orientation, the disabled/ADA. (Prerequisite: Recommendation: Completion of 10-809-196, Introduction to Sociology or 10-809-197, Contemporary American Society prior to this course).

**10-809-195 ECONOMICS** ...scarcity, resources, alternative economic systems, growth, supply and demand, monetary and fiscal policy, inflation, unemployment, and global economic issues.

**10-809-196 INTRODUCTION TO SOCIOLOGY** ...the nature and variety of groups; inequality, race and ethnicity; family, population, social integration, and change; collective behavior; politics, economics, religion, education, and the effects of technology.

**10-809-198 INTRODUCTION TO PSYCHOLOGY** ...survey of theoretical foundations of human behavior such as sensation and perception, motivation, emotions, learning, personality, psychological disorders, therapy, stress, and human diversity in personal, social and vocational settings.

# Individualized Technical Studies - Journeyworker Program Code 104995

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Individualized Technical Studies-Journeyworker is designed for journeyworkers from various trades who are interested in continuing their education and earning a degree customized to their career interests. Thirty-nine credits are granted toward the degree based upon completion of a Wisconsin Journey Certificate that includes 400 hours or more of instruction. With a college advisor, the journeyworker identifies the knowledge and skills required to achieve specific career goals. Existing NWTC courses become components of the journeyworker's program of study. At a time when the workplace is continuously changing with advancing technology and flexible organizational practices, new and nontraditional skills are required of the successful worker.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Completion of all recommended activities to address math and reading skills deficiencies.

### Employment Potential

The individualized nature of this program allows students to take advantage of the skills they have acquired in the apprenticeship program, enhance those skills with coursework from an area of interest, and prepare for a wide variety of workplace opportunities.

### Curriculum

Upon graduation from the Individualized Technical Studies-Journeyworker program, a student will have completed 60 credits.

Required Program Components	Credits
Wisconsin Journey Certificate	39

Advanced standing will be granted for the 39 credits with the completion of the apprenticeship if it includes a minimum of 400 hours of paid related training (day school).

Catalog No.	Description	Credits
10-801-195	Written Communication	3
10-801-197	Technical Reporting	3
10-804-110	Elem Algebra w Apps	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-196	Intro to Sociology	3
10-809-198	Intro to Psychology	3
10-999-939	Technical Studies-Occupational	39
<b>Semester Total</b>		<b>60</b>
<b>Total Credits</b>		<b>60</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**10-801-195 WRITTEN COMMUNICATION** ...the nature and scope of academic and business writing. Develops writing skills which include pre-writing, drafting, revising, and editing. A variety of writing assignments are designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents.

**10-801-197 TECHNICAL REPORTING** ...principles of report writing and correspondence, proposals, feasibility reports, progress reports, investigation reports, evaluation reports, meeting reports, memos, and correspondence. (Prerequisite: 10-801-195, Written Communication).

**10-804-110 ELEMENTARY ALGEBRA WITH APPLICATIONS** ...traditional algebra topics with applications. Learners develop algebraic problem solving techniques needed for technical problem solving and for more advanced algebraic studies. Topics include linear equations, exponents, polynomials, rational expressions, and roots and radicals. Successful completion of this course prepares learners to succeed in technical mathematics courses. (Prerequisite: Recommendations: TABE Level A math score = 10.7 GE Math OR Accuplacer = 70.)

**10-809-172 RACE ETHNIC & DIVERSITY** ...basic American values of justice and equality by teaching vocabulary, history of immigration/conquest, transcultural communication, legal liability, multicultural majority/minority relations, ageism, sexism, gender, sexual orientation, the disabled/ADA. (Prerequisite: Recommendation: Completion of 10-809-196, Introduction to Sociology or 10-809-197, Contemporary American Society prior to this course).

**10-809-195 ECONOMICS** ...scarcity, resources, alternative economic systems, growth, supply and demand, monetary and fiscal policy, inflation, unemployment, and global economic issues.

**10-809-196 INTRODUCTION TO SOCIOLOGY** ...the nature and variety of groups; inequality, race and ethnicity; family, population, social integration, and change; collective behavior; politics, economics, religion, education, and the effects of technology.

**10-809-198 INTRODUCTION TO PSYCHOLOGY** ...survey of theoretical foundations of human behavior such as sensation and perception, motivation, emotions, learning, personality, psychological disorders, therapy, stress, and human diversity in personal, social and vocational settings.



# Industrial Mechanic

Program Code 314622

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Industrial Mechanic prepares students to evaluate machine performance, identify trouble areas, and repair systems.

### Program Outcomes

- Interpret the elements of mechanics.
- Use measuring devices.
- Use hand, stationary, and portable power tools.
- Prepare mounting bases for machine installation.
- Identify and use threaded fasteners and various locking and holding devices.
- Identify types of structural steel shapes.
- Apply safety requirements to rigging an object.
- Classify valves used in a piping system.
- Describe the difference between machine, carbon, and alloy steels.
- Identify and maintain types of bearings.
- Apply lubricants.
- Demonstrate parallel shaft alignment.
- Maintain chain drive component systems.
- Identify types of gears.
- Identify types of couplings.
- Replace and test electrical motors.
- Identify pipe systems, demonstrate correct pipe assembly and installation procedures.
- Maintain and repair hydraulic systems.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and industrial education.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Industrial or Maintenance Mechanic:** installs, repairs, and maintains the operating condition of industrial production and processing machinery.

**Machine Adjuster:** adjusts and maintains machinery for optimum manufacturing production.

**Machine Assembler:** assembles machines, equipment, and their subassemblies following blueprints and assembly procedures.

**Machinery Erector:** erects and tests machinery and heavy equipment, replaces defective parts of a machine, adjusts clearances and alignment of moving parts, and dismantles machinery and equipment for shipment to the installation site.

**Machinery Repairer:** inspects, maintains, repairs, and adjusts machinery and equipment in order to ensure its proper operation in the various industries.

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

- Lead Mechanic
- Maintenance Supervisor
- Master Mechanic
- Millwright

### Curriculum

The Industrial Mechanic Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 35 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-106	Intro to College Math	3
31-420-314	Machine Shop-Basic	4
31-421-355	Blueprint Rdg/Sket-Indus	2
31-462-305	Mechanic 1-Industrial	5
31-462-306	Mechanic 2-Industrial	5
<b>Semester Total</b>		<b>19</b>

#### Second Semester

31-442-365	Welding-Industrial	3
31-462-307	Mechanic 3-Industrial	5
31-462-308	Mechanic 4-Industrial	5
31-462-356	Hydraulics-Industrial	2
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>35</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**31-420-314 MACHINE SHOP-BASIC** ...lathe/drilling/milling machines, shapers, grinding machines, tool sharpening, bench work layout, measuring, inspection techniques, and machine part repair/fabrication.

**31-421-355 BLUEPRINT READING/SKETCHING-INDUSTRIAL MECHANIC** ...orthographic/ isometric sketching, multiview print reading, dimensioning and tolerancing, section/auxiliary views, weld symbols, piping/hydraulic prints, and electric motor prints.

**31-442-365 WELDING-INDUSTRIAL** ...oxyacetylene process, oxyacetylene welding, brazing, cutting, metal arc welding, gas metal arc welding, and gas tungsten arc welding (ferrous and non-ferrous metals).

**31-462-305 MECHANIC 1-INDUSTRIAL** ...basic elements of mechanics: precision measurements, safe use of hand and power tools, industrial lift truck operation, sheet metal layout and fabrication, machine mounting bases mechanical fasteners.

**31-462-306 MECHANIC 2-INDUSTRIAL** ...structural steel nomenclature and installation, safe and proper use of scaffolding, rigging and weight estimation, maintenance of hand and cutting tools, speciality tool fabrication, piping systems, and tubing systems. (Corequisite: 31-462-305, Mechanic 1 Industrial)

**31-462-307 MECHANIC 3-INDUSTRIAL** ...basic metallurgy, functions of gaskets, packing and mechanical seals, lubrication properties and systems, bearing types and functions, electrical knowledge and safety. (Prerequisite: 31-462-306, Mechanic 2-Industrial)

**31-462-308 MECHANIC 4-INDUSTRIAL** ...belt drives, chain drives, power transmission couplings, gear drives, preventative maintenance. (Corequisite: 31-462-307, Mechanic 3-Industrial)

**31-462-356 HYDRAULICS-INDUSTRIAL** ...hydraulic/pneumatic system maintenance, hydraulic pump repair, motors, controls, actuators, and pneumatic components.



# Instructional Assistant

Program Code 105222

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Instructional Assistant program is an Associate of Applied Science Degree, which prepares qualified individuals to work directly with students under the supervision of a licensed teacher. The duties include assisting children with math, reading, and writing assignments as well as handling classroom management, supporting students with special needs, clerical and other tasks related to instruction. This program meets Title I and No Child Left Behind paraeducator requirements.

Duties may also include monitoring student activities, assisting with reading or math, correcting papers, tutoring, one-on-one activities and small group facilitation. In addition, instructional assistants work on classroom displays, assist children with computers and media, provide educational and personal hygiene support to meet individual student needs, and supervise various classroom and other school events. Instructional assistants may be hired to provide instructional services to students from pre-kindergarten through age 21, however, the focus of this program is on preparing graduates to work primarily in elementary and middle level schools.

### Program Outcomes

- Support all learning based on knowledge of subject matter.
- Identify developmentally appropriate child/adolescent physical, social/emotional, intellectual, and language characteristics and their developmental and environmental impact on learning.
- Adapt instruction to meet the diverse needs of all learners.
- Utilize a variety of instructional strategies, media, and technology to foster the development of critical thinking and problem solving.
- Use proactive classroom management techniques to promote a positive class climate, intrinsic motivation, and optimal learning.
- Demonstrate effective written and verbal communication in working collaboratively within the school setting and interactions with students and families.
- Assist in planning and implementing instructional strategies that reflect the learning cycle.
- Utilize informal assessment strategies to collect data for the support of student learning.
- Incorporate the reflective process to promote student learning and professional growth.
- Assume professional responsibility for ethical, moral, and legal policies and procedures.
- Provide for health and safety needs of students.

### Employment Potential

A graduate of this program will have the potential for employment as an instructional assistant or educational paraprofessional in schools from the pre-kindergarten through high school level. Instructional assistants work with children in early care and education settings, preschools, elementary schools, middle schools, and high schools. Instructional assistants work with children with special needs.

Most job opportunities in this field coincide with the public school system with regard to workdays, holidays, and summers.

**Graduates Work As:** Teacher assistants, instructional assistants, paraeducators, paraprofessionals, specialized aides in reading, math, computers, or special education, and autism therapists.

**Typical Activities Include:** Preparing classroom displays, using computers, supervising classroom and playground activities, giving tests, monitoring students, reading and telling stories, assisting with small and large group activities, managing student behavior, supporting individual needs of all students, and following teacher lesson plans.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Demonstrated proficiency in basic skills through a course placement assessment.
- It is necessary to show good health as evidenced by a medical examination within one year prior to beginning practicum classes.
- Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into the Instructional Assistant program must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to classroom placement at the discretion of the educational site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee classroom placement, or guarantee graduation within typical program timing.

### Curriculum

The Instructional Assistant Associate Degree is a two-year program. Upon graduation, a student will have completed 65 credits. Courses are offered online, and may be taken in any order as long as prerequisites are met. Below is a suggested timeline.

#### First Semester

Catalog No.	Description	Credits
10-522-103	IA: Intro to Educational Prac	3
10-522-104	IA: Technology/Media Rsrces	3
10-801-198	Speech	3
10-809-188	Developmental Psychology	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>

#### Second Semester

10-522-102	IA: Techniques/Readg/Lang Art	3
* 10-522-105	IA: Practicum 1	2
10-522-106	IA: Child/Adolescent Dev	3
10-522-107	IA: Overview of Special Ed	3
10-522-111	IA: Guiding & Mnging Behavior	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-522-101	IA: Teamwork in School Setting	3
* 10-522-115	IA: Practicum 2	2
10-522-118	IA: Techniques for Math	3
10-801-195	Written Communication	3
10-809-172	Race Ethnic & Diversity	3
	Elective	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-522-120	IA: Techniques for Science	3
10-522-122	IA: Adv Readg/Language Arts	3
10-522-123	IA: Positive Classrm Mgmt Tech	2
10-522-124	IA: Support Students w Disab	3
* 10-522-125	IA: Practicum 3	2
10-804-106	Intro to College Math	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>65</b>

\*Required 72 hours in classroom under supervision of K-12 teacher. NWTC Faculty arranges practicum settings for/with students. Students are required to achieve a grade of "C" or higher in the practicum courses to continue in or graduate from this program.

Completed criminal record check and medical exam are required prior to starting the practicums.

This program is fully eligible for financial aid.



## 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](http://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.*

### 10-522-101 IA: TEAMWORK IN SCHOOL SETTINGS

...group dynamics, school and class policies, liability, confidentiality, legal issues and safety issues as they relate to the role of the instructional assistant as a member of a team.

### 10-522-102 IA: TECHNIQUES/READING/LANGUAGE ARTS

...instructional assistant's role in reading/language arts. Work with all children individually and in groups through questioning, listening, guiding techniques. Addresses the use of current classroom materials plus enrichment/support activities.

### 10-522-103 IA: INTRODUCTION TO EDUCATIONAL PRACTICES

...fundamentals of teaching methodologies, learning styles, factors influencing teaching effectiveness, strategies to meet the needs of all learners, questioning techniques, and basic assessment practices.

### 10-522-104 IA: TECHNOLOGY/MEDIA RESOURCES

...gain hands-on computer and media experience; operate media equipment. Various school related documents prepared with selected software. Images incorporated into documents using digital cameras and scanners.

**10-522-105 IA: PRACTICUM 1** ...introduces the student to a pre-kindergarten, kindergarten, elementary, middle or high school classroom. The student will observe children and practice techniques under the direction of the classroom teacher.

### 10-522-106 IA: CHILD/ADOLESCENT DEVELOPMENT

...growth and development birth through adolescence. Acquaints the learner with the fundamental tasks of physical, motor, perceptual, cognitive social/emotional and language development.

### 10-522-107 IA: OVERVIEW OF SPECIAL EDUCATION

...classifications of special education, K-12. Studies include causes of special needs/ intervention strategies. Examines key development milestones and how they relate to physical, mental, emotional or social development of children.

### 10-522-111 IA: GUIDING & MANAGING BEHAVIOR

...guiding children's behavior to keep them safe/healthy. Includes strategies for improving behavior problems at all levels in the inclusive classroom, on the bus, the playground, and on fieldtrips.

### 10-522-115 IA: PRACTICUM 2

...further responsibilities in a classroom setting in pre-kindergarten, kindergarten, elementary, middle or high school. The student will work with children or youth under the direction of the classroom teacher. (Prerequisite: 10-522-105, IA: Practicum 1)

### 10-522-118 IA: TECHNIQUES FOR MATH

...learn techniques to assist classroom teacher in group and individual math activities. Current math practice including manipulatives, problem solving and assessment will be covered within the framework of state/national standards.

**10-522-120 IA: TECHNIQUES FOR SCIENCE** ...study and practice strategies of teaching science; assist the classroom teacher in group and individual science activities; explore current science processes, strategies, procedures, assessment options and factors affecting science learning.

### 10-522-122 IA: ADVANCED READING/LANGUAGE ARTS

...supporting/encouraging children as independent, strategic readers as well as techniques to support children through the writing process. Children's literature will be integrated throughout the course. (Prerequisite: 10-522-102, Techniques for Reading/ Language Arts)

### 10-522-123 IA: POSITIVE CLASSROOM MANAGEMENT TECHNIQUES

...issues such as divorce, alcoholism, child abuse, youth suicide and gangs on behavior in the classroom. Examines conflict resolution techniques with an emphasis on de-escalation strategies and prevention. (Prerequisite: 10-522-111, Guiding/Managing Behavior)

### 10-522-124 IA: SUPPORT STUDENTS WITH DISABILITIES

...strategies to manage the learning environment proactively to prevent behavior problems and promote learning for students with developmental disabilities. (Prerequisite: 10-522-107, IA: Overview of Special Education)

### 10-522-125 IA: PRACTICUM 3

...putting into practice knowledge/skills learned from program courses under direction/supervision of certified teacher or qualified school personnel. Job search skills will be addressed. Creating a Professional Portfolio will be expected. (Prerequisite: 10-522-115, IA: Practicum 2)

# Jewelry Repair and Fabrication

Program Code 314411

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Jewelry Repair and Fabrication Program prepares students to design, create, and repair jewelry by applying a variety of manufacturing and fabrication processes and techniques.

### Program Outcomes

- Perform basic bench jewelry task/functions.
- Explain repair work to customer.
- Set stones.
- Produce jewelry using basic jewelry manufacturing skills.
- Identify characteristics of precious metals and gemstones.
- Produce finished jewelry pieces.
- Express ideas through jewelry illustrations.
- Perform jewelry sales associate skills.
- Adapt computer skills acquired as a student to the jewelry industry standards.
- Communicate effectively within the jewelry industry.
- Communicate information technology within the jewelry industry.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math defined as addition, subtraction, multiplication and division. Students should have mastered basic math skills and have an awareness of algebraic formulas. For description of basic math and algebra, see the Basic Education section of this catalog.

### Employment Potential

Graduates in these occupations repair and/or fabricate jewelry according to customer and/or owner specifications.

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

**Bench Jeweler:** repairs jewelry, with fabrication, stone setting, and manufacturing skills.

**Goldsmith:** works with gold in the repairing and manufacturing of jewelry.

**Stone Setter:** is a jeweler who has specialized in the setting of stones in mountings, and demonstrates a high skill level, achieved with practice.

**Silversmith:** works with silver in the repairing and manufacturing of jewelry, utilitarian, and decorative items.

**Jewelry Sales Representative:** sells retail or wholesale jewelry, tools, and/or equipment.

**Jewelry Designer:** provides artistic drawings of jewelry designs that meet customer and/or owner approval.

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

- Trade Shop Owner
- Jewelry Department Manager
- Jewelry Store Owner
- Jewelry Equipment Representative
- Hand Engraver
- Certified Gemologist
- Graduate Gemologist
- Appraiser
- Gold Metallurgist

### Curriculum

The Jewelry Repair and Fabrication Technical Diploma is a nine-month, two-semester program. Upon graduation, a student will have completed 36 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-121	Micro: Word-Intro	1
OR		
10-103-131	Micro: Excel-Intro	1
OR		
10-103-151	Micro: PowerPoint-Intro	1
10-804-123	Math w Business Apps	3
31-111-310	Jewelry Design/Illustrate	2
31-441-311	Jewelry Repair 1	3
31-441-312	Jewelry Manufacturing 1	3
31-441-313	Stone Setting 1	3
31-441-316	Precious Metals	1
31-441-317	Gemology 1	2
<b>Semester Total</b>		<b>18</b>

#### Second Semester

31-104-313	Retail Merchandising	3
31-441-318	Gemology 2	3
31-441-321	Jewelry Repair 2	3
31-441-322	Jewelry Mfg Tech 2	3
31-441-323	Stone Setting 2	3
31-441-328	Power Engraving	1
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>36</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**31-104-313 RETAIL MERCHANDISING** ...characteristics of a small business, planning and organizing a new jewelry business, marketing and selling the jeweler's product or service, profit planning and control, and jewelry merchandising.

**31-111-310 JEWELRY DESIGN/ILLUSTRATION** ...basic drawing skills, use of templates, shading, drawing stones, and basic jewelry design; designing an original piece of jewelry from concept through presentation and promotional illustration.

**31-441-311 JEWELRY REPAIR 1** ...basic jewelry repair, sizing up, down, and reshanking, soldering heads in place, fabrication of rings and determining stone size in brass alloy, silver, and/or gold objects.

**31-441-312 JEWELRY MANUFACTURING 1** ...use common metals, hand tools and equipment use, casting, fabricating, electroplating, rubber molds, wax injection models, and production of finished jewelry pieces. (Corequisite: 31-441-311, Jewelry Repair 1)

**31-441-313 STONE SETTING 1** ...4-prong tiffany setting, bezel setting, 6-prong oval setting, gypsy setting and 2 end cap marquise setting. (Corequisites: 31-441-311, Jewelry Repair 1 and 31-441-312, Jewelry Manufacturing 1)

**31-441-316 PRECIOUS METALS** ...identify: precious metals content, solder determination, gold alloys, metal pricing and precious metal refinement.

**31-441-317 GEMOLOGY 1** ...identify: gemological equipment classification, stone optical/physical property and determination, basic minerals, diamonds and gemstone pricing.

**31-441-318 GEMOLOGY 2** ...identify and evaluate the physical/optical properties of colored gemstones and diamonds through testing and evaluation. (Prerequisite: 31-441-317, Gemology 1)

**31-441-321 JEWELRY REPAIR 2** ...different jewelry repair, retipping, rebuilding heads, replacing heads, and adding or replacing stones on brass alloy, silver, and/or gold objects, use of decorative elements to a mounting. (Prerequisite: 31-441-311, Jewelry Repair 1)



**31-441-322 JEWELRY MANUFACTURING TECHNIQUES 2** ...a variety of manufacturing techniques, centrifugal casting process, production of a line of jewelry with the use of rubber molds and injection wax. (Prerequisite: 31-441-312, Jewelry Manufacturing 1)

**31-441-323 STONE SETTING 2** ...plate setting, construction of a head setting or bright cutting, channel setting and other advanced setting techniques of fancy shaped stones. (Prerequisite: 31-441-313, Stone Setting 1)

**31-441-328 POWER ENGRAVING** ...this course provides the learner with the skills to design and do a layout for an engraving and use a power engraver to set stones and create decorative designs.



# Landscape Horticulture Technician

Program Code 100014

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Landscape Horticulture Technician program prepares a student for employment in the horticulture industry. Instruction will focus on landscape designing, plant installation, maintenance and hardscape skills.

### Program Outcomes

- Communicate within the horticulture industry.
- Justify the selection of the appropriate woody plant(s) under the given circumstances for the project at hand.
- Justify the selection of the appropriate herbaceous plant(s) under the given circumstances for the project at hand.
- Execute IPM (Integrated Pest Management).
- Prescribe and execute proper landscape maintenance plans.
- Determine nutritional requirements of turf grasses and ornamentals.
- Analyze soil and its influence on plant life.
- Design and build landscapes.
- Implement a landscape construction design plan.
- Operate a transit.
- Use carpentry hand and power tools.
- Safely operate landscape equipment.
- Operate computer hardware system.
- Develop and deliver a landscape design presentation.
- Use CAD (Computer Aided Design).
- Receive training for Wisconsin Pesticide Certification exam.
- Propagate and grow horticulture plants.
- Use masonry hand and power tools.
- Design and install irrigation equipment.
- Diagnose and treat pest problems on ornamental plants.
- Identify and maintain tropical indoor plants.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog

### Employment Potential

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

**Landscape Horticulture Technician:** performs pencil sketching of common ideas, designs landscapes; builds and installs hardscapes and plants; writes cost estimates for labor and materials, performs ground maintenance, safely operates landscape and construction equipment. Has working knowledge of the safe use of pesticides.

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

- Grounds Manager
- Sales Representative
- Garden Center Manager
- Pest Control Specialist
- Garden Center Specialist
- Golf Course Maintenance Assistant
- Lawn Care Equipment Operator
- Turf Technician or Interior Plantscaper

### Curriculum

The Landscape Horticulture Technician Associate Degree is a two-year, four-semester program.

Upon graduation, students will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-001-110	Horticulture-Intro	3
10-001-158	Plant-Woody Ornamental	3
10-001-159	Flowers-Herbaceous	3
10-606-112	Engineering Applications	1
10-606-127	Landscape Dsgn Studio Intro	1
10-801-196	Oral/Interpersonal Comm	3
10-809-197	Contemporary Amer Society	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-001-122	Fundamentals Plant Nutrition	1
10-001-153	Plant and Soil Science	3
10-001-154	Turf Management	3
10-001-180	Landscape Installation Intro	2
10-606-125	Landscape Design Technology	2
10-804-110	Elem Algebra w Apps	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Summer Semester

10-001-151	Landscape/Hort Internship	3
<b>Semester Total</b>		<b>3</b>

#### Third Semester

10-001-109	Landscape Installation-Adv	2
OR		
10-001-108	Plant Propagation	2
10-001-170	Integrated Pest Management	2
10-001-172	Landscape Maintenance	2
10-001-174	Prin of Landscape Design/Graph	3
10-104-191	Customer Service Mgmt	3
10-801-195	Written Communication	3
Elective		1
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-001-115	Landscaping-Applied	4
10-001-182	Irrigation	2
OR		
10-001-140	Plant Diagnostic Skills	2
10-001-184	Landscape Design Studio-Adv	3
OR		
10-001-130	Plant-Interior	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>68</b>

#### Suggested Electives:

Golf Course Management, 10-001-150  
Spanish 1, 10-802-101  
Greenhouse Grower I, 10-001-111  
Greenhouse Grower 2, 10-001-112  
Plant Health Care, 10-001-123

This program is fully eligible for financial aid.

## 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](http://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.*

**10-001-108 PLANT PROPAGATION** ...plant propagation and production techniques. (Prerequisites: 10-001-110, Intro to Horticulture; 10-001-158, Plant-Woody Ornamental 1; 10-001-159, Flowers-Herbaceous 1)

**10-001-109 LANDSCAPE INSTALLATION-ADVANCED** ...builds upon landscape construction methods learned in Introduction to Landscape Installation. Possible projects include mixed material patios, retaining walls, water features, sustainable landscape elements, rain gardens, roof gardens, wooden structures, etc. (Prerequisite: 10-001-180, Landscape, Installation-Introduction)

**10-001-110 HORTICULTURE-INTRODUCTION** ...explore the horticulture industry, plant culture, identification, propagation, physiology, selected aspects of horticulture industry including fruits, vegetables, ornamentals, greenhouse systems, landscape techniques, home gardens, and turf.

**10-001-115 LANDSCAPING-APPLIED** ...provides the opportunity for the learner to develop the knowledge, skills, processes and understanding of applying the course work learned throughout the two years of the Associate Degree program. (Prerequisites: 10-001-170, Integrated Pest Management; 10-001-172, Landscape Maintenance; 10-001-174, Prin of Landscape Design/Graph)

**10-001-122 FUNDAMENTALS OF PLANT NUTRITION** ...fundamentals of plant nutrition, identification & analysis of the nutritional needs of plants; covers the selection of appropriate materials & application rates & methods. (Prerequisite: 10-001-110, Horticulture-Introduction)

**10-001-130 PLANT-INTERIOR** ...how to identify indoor tropical plants and blooming plants that are used in interior landscaping. Includes identification, plant varieties, pests, diseases, and cultural requirements. Also designing with houseplants. (Prerequisite: 10-001-110, Intro to Horticulture)

**10-001-140 PLANT DIAGNOSTIC SKILLS** ...science of making proper diagnoses of plant insects and disease problems and appropriate control strategies. Holistic diagnoses and sustainable methods will be emphasized. (Prerequisite: 10-001-110, Intro to Horticulture)

**10-001-151 LANDSCAPE/HORTICULTURE INTERNSHIP** ...job opportunities in the field, applying scholastic knowledge to practical applications, and cooperation with an employer. (Prerequisites: Accepted to the Landscape Horticulture Program; 10-001-158, Plant-Woody Ornamental; 10-001-159, Flowers-Herbaceous; 10-001-122, Fundamentals Plant Nutrition; 10-001-153, Plant and Soil Science; 10-001-154, Turf Management; 10-001-180, Landscape Installation Intro)

**10-001-153 PLANT AND SOIL SCIENCE** ...addresses the unique interactions of plants & soils; examines the physical, chemical & biological characteristics of soils and how they impact the structure & functions of plants. (Prerequisite: 10-001-110, Intro Horticulture)

**10-001-154 TURF MANAGEMENT** ...identification of turf grasses; course will examine natural low-maintenance turf, residential lawns and high intensity applications (i.e. golf courses, athletic fields). (Prerequisite: 10-001-110, Intro Horticulture)

**10-001-158 PLANT-WOODY ORNAMENTAL** ...physiology, culture, identification, and use of primarily temperate woody plant materials appropriate for landscapes in northeastern Wisconsin. (Corequisite: 10-001-110, Horticulture-Intro)

**10-001-159 FLOWERS-HERBACEOUS** ...annuals/perennials/roses; using flowers/foliage effectively in the landscape; care of each flower emphasizing selection/tips to best utilize each flower; groundcover/vines included. (Corequisite: 10-001-110, Horticulture-Intro)

**10-001-170 INTEGRATED PEST MANAGEMENT** ...various methods to combat plant pests in an environmentally responsible manner; using biorational techniques and strategies. (Prerequisite: 10-001-110, Intro to Horticulture)

**10-001-172 LANDSCAPE MAINTENANCE** ...identifying problems and cultural challenges in the landscape; pruning techniques, insect/disease problems, weed identification; soil fertility; resolve situations in the field. (Prerequisites: 10-001-110, Horticulture-Introduction, 10-001-153, Plant Culture/Soil Fund, 10-001-120, Plant Nutrition/Fertilizer)

**10-001-174 PRINCIPLES OF LANDSCAPE DESIGN AND GRAPHICS** ...residential design methods utilizing outdoor room concepts: function, design principles, and composition in developing a landscape plan; drafting, site analysis, graphics. (Prerequisites: 10-001-110, Horticulture-Intro; 10-606-127, Landscape Design Studio Introduction)

**10-001-180 LANDSCAPE INSTALLATION INTRODUCTION** ...investigate techniques used in landscape construction practices. These include the use of specific landscape tools, plan implementation methods, preliminary site survey methods, proper planting, equipment operations & installations of basic landscape features. (Prerequisite: 10-606-127, Landscape Design Studio Introduction)

**10-001-182 IRRIGATION** ...irrigation practices, procedures, and equipment in the turf and landscape industry; design, installation, and operation of irrigation systems and components. (Prerequisite: 10-001-154, Turf Management 1)

**10-001-184 LANDSCAPE DESIGN STUDIO-ADVANCED** ...exploration of design elements through individual practicum; survey of landscape design history, land-use planning, topographic design, structural planning of retaining walls, ornamental ponds, bioretention, lighting theory, sustainable practices and bidding procedures. (Prerequisite: 10-001-174, Principles of Landscape Design and Graphics)

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

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

**10-606-125 LANDSCAPE DESIGN TECHNOLOGY** ...using computer and computer aided design software as tools for design communication; it is intended to be an introduction to the fundamental components of CAD in landscape design. Property lines, topography, site planning, hardscapes, planting plans, and section view graphics will be covered. (Prerequisites: 10-606-112, Engineering Applications; 10-606-127, Landscape Design Studio)

**10-606-127 LANDSCAPE DESIGN STUDIO INTRODUCTION** ...introduction to the techniques of hand drafting and rendering through studio exercises; drafting and sketching techniques include architectural lettering, isometric drawing, section and elevation views, using scales, rendering procedures, etc.

# Leadership Development

Program Code 101961

## Associate Degree

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Leadership Development program provides educational experiences to individuals preparing for, or already engaged in, leadership positions and opportunities to explore specific applications in a given occupation. The program is offered on an accelerated, flexible, part-time or full-time schedule to accommodate working adults.

### Program Outcomes

- Demonstrate effective leadership skills.
- Practice ethical leadership.
- Perform in team environments.
- Facilitate effective meetings.
- Value diversity.
- Demonstrate workplace communication skills.
- Understand the financial components of an organization.
- Utilize performance management techniques.
- Apply project management skills.
- Demonstrate professionalism in management of time, stress and assertiveness.
- Advocate for organizational change.
- Apply continuous improvement processes.
- Affect workplace safety positively.
- Apply current legal workplace standards.
- Demonstrate innovative and creative thinking.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- It is recommended that a student have a minimum of two years work experience and basic computer skills in Word, Excel, and PowerPoint prior to entering the Leadership Development program.

### Employment Potential

This program is designed to attract persons who are already engaged in, or are preparing for, leadership roles in an organization. An employee who is already in a leadership or other management level position will be able to expand his/her level of effective leadership skills.

An employee not currently in a first level management role will enhance leadership skills and increase the chance of promotion into a leadership role.

A graduate of the program who has little or no previous leadership experience, or a short employment record, will learn effective leadership skills useful on the job and in the community. Traditionally a supervisor plans, organizes, directs, and coordinates activities of non-management employees in various occupational settings; trains and evaluates employees under her or his authority; implements policy decisions and work systems established by upper management; and facilitates intradepartmental and interdepartmental communication and work flow.

In addition to traditional leadership or supervisory skills and practices, today's leaders must understand system(s), variation, and the continuous improvement processes; be facilitators rather than bosses; effectively manage work place diversity; help organizations adapt to change and encourage innovation; display leadership skills; use critical thinking skills; and use communication skills appropriate to the new team environment.

### Note

- The 12 technical studies courses, beginning with course number 10-196-xxx, are delivered in a variety of formats such as accelerated, online, in person or video conference.
- Some accelerated courses have a compressed schedule of six weeks each. The competencies learned in an accelerated class are exactly the same as those in a traditional class. Students do much of the learning and assignments outside of class time.
- Various Leadership Development Certificates are available. Refer to the program website for information.

### Suggested Skills for Success

Learners may select accelerated or traditional general studies courses in any sequence while attending technical studies courses.

### Curriculum

Upon graduation, a student will have completed 66 credits.

### Technical Studies

Catalog No.	Description	Credits
10-101-184	Business Finance/Budgeting	3
10-102-158	Business-Intro	3
10-196-134	Legal Issues-Supervisors	3
10-196-136	Safety-Workplace	3
10-196-145	Workplace Innovation	3
10-196-164	Supervisors-Personal Skills	3
* 10-196-168	Organizational Development	3
10-196-169	Diversity in the Workplace	3
10-196-188	Project Management	3
10-196-189	Team Building/Prob Solve	3
10-196-190	Leadership Development	3
10-196-191	Supervision	3
10-196-192	Managing-Quality	3
10-196-193	Human Resource Mgmt	3
10-196-199	Business Ethics	3
<b>Technical Studies Credits</b>		<b>45</b>

### General Studies

10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Comm	3
10-801-198	Speech	3
10-804-123	Math w Business Apps	3
10-809-195	Economics	3
10-809-197	Contemporary Amer Society	3
10-809-199	Psychology Of Human Relations	3
OR		
10-809-198	Intro to Psychology	3
<b>General Studies Credits</b>		<b>21</b>
<b>Total Credits</b>		<b>66</b>

\* It is suggested that this course be taken toward the end of program courses.

This program is fully eligible for financial aid.



## 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](http://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.*

**10-101-184 BUSINESS FINANCE/BUDGETING** ...fiscal and monetary aspects of business. Each learner will demonstrate application of business types, cycles, forecasting, budgeting, expense control, and financial statement interpretation relevant to the supervisor as a non-accountant.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-196-134 LEGAL ISSUES-SUPERVISORS** ...legal practices of recruiting, interviewing, hiring, selection, evaluation/promotion, employee discipline, firing, EEOC and nondiscrimination, employee privacy, workplace harassment, FMLA, ADA and unions.

**10-196-136 SAFETY-WORKPLACE** ...safety awareness, federal/state/local compliance, inspections, risk analysis, workplace violence, substance abuse, health hazards, first aid, CPR, fire and electrical safety, and emergency preparedness.

**10-196-145 WORKPLACE INNOVATION** ...use of inventive thinking techniques and innovative methods to improve work processes in multiple workplace environments; research and analyze the use of technology in businesses to promote innovation in the workplace; and develop an innovative, entrepreneurial, and intrapreneurial mindset.

**10-196-164 SUPERVISORS-PERSONAL SKILLS** ...time management and personal planning, emotional intelligence, effective communication, assertiveness and stress management related to the challenges of a supervisor.

**10-196-168 ORGANIZATIONAL DEVELOPMENT** ...develop more effective organizations through models of diagnosis, interventions and change strategies related to organizational culture, structure, job design, employee participation, goal setting, performance management and effective strategic planning in a global environment.

**10-196-169 DIVERSITY IN THE WORKPLACE** ...diversity in the workplace, analyze the effect of perceptions, attitudes, biases, and organization culture on diversity, dealing with barriers, measuring progress, and celebrating success.

**10-196-188 PROJECT MANAGEMENT** ...the role of project management, developing a project proposal, use of relevant software, working with project teams, sequencing tasks, charting progress, dealing with variations, budgets and resources, implementation, and assessment.

**10-196-189 TEAM BUILDING/PROBLEM SOLVING** ...benefits and challenges of group work, necessary roles in a team, stages of team development, meeting facilitation, different approaches to problem solving, consensus, data acquisition, analysis, developing alternative solutions, implementation and evaluation.

**10-196-190 LEADERSHIP DEVELOPMENT** ...leadership effectiveness and organization requirements, individual and group motivation strategies, vision, mission and goals, ethical behavior, leadership style and adaptation, impacts of power and influence, employee development, coaching, managing change, and conflict resolution.

**10-196-191 SUPERVISION** ...front-line leadership including teamwork, setting goals, planning, delegation, controlling, communication, motivation, performance management, staffing, training, problem solving, and conflict management.

**10-196-192 MANAGING-QUALITY** ...developing a personal philosophy of quality, identifying all stakeholder relationships, meeting/exceeding customer expectations, managing a quality improvement project, measuring effectiveness, lean thinking, six sigma, and systems thinking.

**10-196-193 HUMAN RESOURCE MANAGEMENT** ...impacts of EEOC, writing job descriptions, recruitment, selection, conducting job interviews, orientation, developing policies and procedures, training, performance, counseling and development, and compensation and benefit strategies.

**10-196-199 BUSINESS ETHICS** ...ethical points-of-view, morality/ethical theory, utilitarianism, Kantian ethics, justice and the market system, whistle-blowing, trade secrets/conflict of interest, privacy, advertising, product safety, corporate social responsibility, international business.

# Machine Tool - CNC Technician

Program Code 324441

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Machine Tool - CNC Technician program offers students an additional year of hands-on computer controlled machining and advanced programming experience for graduates of the Machine Tool Operation program.

### Program Outcomes

- Control multiple axis CNC machines.
- Use efficient production set up techniques.
- Use advanced CNC programming techniques.
- Control optional features of CNC machines.
- Design and construct jigs and fixtures.
- Use precision measuring practices.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic familiarity with Microsoft Windows.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Computer Numerical Control (CNC) Technician/Programmer Operator:** sets up and operates computer numerical controlled machine tools working from blueprints and set-up sheets; sets up fixturing and tooling; produces and inspects parts; and edits CNC programs on CNC lathes and machining centers.

**Jig and Fixture Apprentice/Trainee:** lays out, fits, and assembles parts to make and repair cutting tools, jigs, fixtures, gauges, or machinist's hand tools by analyzing specifications.

**Machinist Apprentice/Trainee:** sets up and operates a variety of machine tools; and fits and assembles parts to fabricate or repair machine tools and to maintain industrial machines.

**Manufacturing Engineering Technician:** supports production in a CNC machining environment.

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

- Journey Level Machinist
- Pattern Maker
- Mold Maker
- Tool and Die Maker
- CNC Programmer
- Machine Shop Foreperson/Supervisor

### Curriculum

The Machine Tool - CNC Technician Technical Diploma is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-106	Intro to College Math	3
31-420-304	CNC Fundamentals 1	3
31-420-345	Machine Shop 1	4
31-420-346	Machine Shop 2	4
31-420-348	Precision Measurement	1
31-420-358	CNC Set-Ups	1
31-421-352	Blueprint Rdg/Sket-Mach 1	2
<b>Semester Total</b>		<b>18</b>

#### Second Semester

31-420-347	Cutting Tool Technology	1
31-420-349	CNC Fundamentals 2	3
31-420-356	Machine Shop 3	4
31-420-357	Machine Shop 4	4
31-421-362	Blueprint Rdg/Sket-Mach 2	2
31-422-359	Metallurgy for Machinist	1
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>

#### Third Semester

31-442-361	Welding-Machine Trades	1
32-420-301	Tool Making	4
32-420-303	Tooling Design	2
32-420-335	CNC Turning Operation	3
32-420-336	CNC Machining Center Oper	3
32-420-337	CNC Fundamentals 3	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-809-197	Contemporary Amer Society	3
32-420-305	Machine Applications-Advanced	4
32-420-307	Machining Theory-Advanced	2
32-420-308	Metrology	1
32-420-309	CNC Machine Mechanics	2
32-420-310	CNC Techniques-Adv	4
32-420-342	CNC Fundamentals 4	2
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

## 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](http://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.*

**31-420-304 CNC FUNDAMENTALS 1** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, and fundamental programming of computer numerically controlled (CNC) milling machines. (Prerequisite: Basic Windows Proficiency)

**31-420-345 MACHINE SHOP 1** ...shop safety, measuring tools/layout, power saw theory/operation, basic theory, operation of drilling machines, bench work, basic engine lathe operation, basic vertical, horizontal, CNC milling machine, surface grinder.

**31-420-346 MACHINE SHOP 2** ...safety, measuring tools/layout, powersaw operation, drilling machine operation basic/theory and operation of engine lathes, basic theory/operation vertical/horizontal milling machines; CNC milling, lathe operation, surface grinder operations. (Corequisite: 31-420-345, Machine Shop 1)

**31-420-347 CUTTING TOOL TECHNOLOGY** ...tool materials, tool geometry, lathe tools, milling cutters, cutting speeds/feeds, drills, reamers, taps, threading tools, carbide inserts, and diamond, ceramic, Cermet and polycrystalline cutting tools.

**31-420-348 PRECISION MEASUREMENT** ...how to read/measure english and metric, rules, squares surface plates, micrometers, vernier calipers, height measuring instruments, gage blocks, angular measurement, go-no-go gages, comparison measurement; surface finish measurement. (Corequisite: 31-420-358, CNC Set Ups)

**31-420-349 CNC FUNDAMENTALS 2** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, fundamental programming of computer numerically controlled (CNC) milling machines, and CNC turning centers. (Prerequisite: 31-420-304, CNC Fun 1)

**31-420-356 MACHINE SHOP 3** ...shop safety, measuring tools/layout, power saws, drilling machine operation, intermediate engine lathed operation and vertical horizontal, CNC milling machine operation, theory/operating grinding machines, operating CNC turning centers. (Prerequisite: 31-420-346, Machine Shop 2)

**31-420-357 MACHINE SHOP 4** ...shop safety, measuring tools, power saw operation, drilling machines, bench work and maintenance, advanced engine lathe operation, advanced vertical horizontal and CNC milling operation, grinding machine operation, and CNC turning centers. (Corequisite: 31-420-356, Machine Shop 3)

**31-420-358 CNC SET-UPS** ...CNC mill and lathe-tool holder selection, loading and unloading tools, work holding, setting part zero, fixture offsets, setting length and dial offsets, boring bars, and bar feeding. (Corequisite: 31-420-348, Prec Msmt)

**31-421-352 BLUEPRINT READING/SKETCHING-MACHINE 1** ...fundamentals of sketching, orthographic projection, auxiliary views, sectional views, dimensioning, precision and non-precision measurement, and general print reading.

**31-421-362 BLUEPRINT READING/SKETCHING-MACHINE TRADES 2** ...blueprint reading, tolerancing, surface finishes, fits (inch & metric), basic welding symbols, casting, stamping, gearing and CAM drawings, and basic geometric tolerancing and dimensioning. (Prerequisite: 31-421-352, Blueprint Reading Sketching-Machine Trades I)

**31-422-359 METALLURGY FOR MACHINIST** ...manufacture of iron and steel, basic composition of metals, metal identification, applied heat treating processes.

**31-442-361 WELDING-MACHINE TRADES** ...oxyacetylene, brazing, soldering, cutting and hardsurfacing, beads and types of joints, plasma arc cutting, gas metal arc, tungsten metal arc welding.

**32-420-301 TOOL MAKING** ...performing various machining, heat-treating, and assembly operations necessary to produce a tool or fixture to be used in a typical manufacturing process. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-303 TOOLING DESIGN** ...interpreting tool and fixturing prints, designing a tool or fixture to be used in a typical manufacturing process. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-305 MACHINE APPLICATIONS-ADVANCED** ...maintain/set-up/operate CNC wire/RAM EDM machines, simulate high-speed machining processes, apply superabrasive tooling, 4th axis milling operations, 3 axis turn/mill/drill applications, 3-D surface machining. (Prerequisite: Completion of 1st and 2nd semester courses.)

**32-420-307 MACHINING THEORY-ADVANCED**...electrical discharge machining (EDM), high speed machining concepts, rapid setup and quick change over procedures, abrasive waterjet, abrasive flow, chemical machining, laser and plasma, palletizing systems. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-308 METROLOGY** ...ISO 9000 concepts, Statistical Process Control (SPC) theory and applications, coordinate measuring machine setup and applications, surface texture measurement concepts, and applications for geometric dimensioning and tolerancing (GD&T), optical comparator and high amplification techniques. (Prerequisite: 31-420-348, Precision Measurement)

**32-420-309 CNC MACHINE MECHANICS** ...CNC machine hydraulics, pneumatics, control, and drive systems.

**32-420-310 CNC TECHNIQUES-ADV** ...Mill 4th and 5th multi-axis programming, parametric programming, 3D surface machining, productivity optimization, lathe live tooling, and c-axis control.

**32-420-335 CNC TURNING OPERATION** ...equipment overview, production planning, machine start-up, control panel operations, CNC control tools, operational codes and functions, operation modes and CNC code generation. (Prerequisite: Completion of 1st and 2nd semester courses.)

**32-420-336 CNC MACHINING CENTER OPERATION** ...equipment overview, production planning, machine start-up, control panel operations, CNC control tools, operational codes and functions, operation modes and CNC code generation. (Prerequisite: Completion of 1st & 2nd semester courses.)

**32-420-337 CNC FUNDAMENTALS 3** ...basic AutoCAD, CNC production planning, advanced 2D programming, 3D surface programming, computer assisted CNC programming. (Prerequisite: 31-420-349, CNC Fundamentals 2)

**32-420-342 CNC FUNDAMENTALS 4** ...CNC process modeling, 4th axis indexing, advanced CNC lathe programming, 4th axis CNC wire EDM programming, and CNC fabrication punch/burner programming applications. (Prerequisite: 32-420-337, CNC Fundamentals 3)



# Machine Tool Operation

Program Code 314201

## Technical Diploma

Offered at the Green Bay and Marinette campuses. For information in Green Bay: (920) 498-5444.  
For information in Marinette: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Machine Tool Operation prepares students to operate machine tools such as engine lathes, milling machines, drill presses, and computer numerical control machines.

### Program Outcomes

- Be successfully employed in the trade.
- Safely set up and operate drill presses.
- Safely set up and operate engine lathes.
- Safely set up and operate horizontal and vertical milling machines.
- Safely set up and operate grinding machines.
- Safely set up, operate, and program computer numerical control milling machines.
- Safely set up, operate, and program computer numerical control turning machines.
- Use semi-precision and precision measuring tools to create parts that meet dimensional specifications shown on part prints.
- Accurately read and interpret blueprints.
- Make mathematical calculations related to machine trades.
- Use a computer-aided manufacturing program to create part profiles and machine code.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic familiarity with Microsoft Windows.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**CNC Operator:** sets up and operates computer numerical controlled machine tools working from blueprints and set-up sheets, sets up fixturing and tooling, produces and inspects parts, and edits CNC programs on lathes and machine centers.

**Machine Set-Up Operator:** sets up and operates a variety of machine tools such as radial drill presses, lathes, milling machines, and grinders; machines metal work pieces, tool, or die parts; analyzes specifications; and determines tooling.

**Machine Tool Operator:** shapes metal to precise dimensions by using machine tools and operates machines such as lathes, milling machines, drill presses, and computer numerical controlled (CNC) machine equipment.

**Machinist:** analyzes specifications; lays out metal stock; sets up and operates machine tools; and operates a variety of machine tools such as radial drill presses, lathes, milling machines, and grinders to machine a variety of metal work pieces.

**Maintenance Machinist:** sets up and operates a variety of machine tools and fits and assembles parts to fabricate or repair machine tools and to maintain industrial machines.

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

- All-Around Machinist
- Journeylevel Machinist
- Pattern Maker
- Set-Up Machinist
- Shop Supervisor
- Tool and Die Maker

### Note

- Starting in the Spring 2009 semester, evening classes will be offered to students on Green Bay campus. Please contact the Trades & Technical office for more information at (920) 498-5461.
- Graduates of the Machine Tool Operation program have the option of continuing with the second year of the Machine Tool - CNC Technician (Green Bay campus) or the Machine Tool Technics (Marinette) programs.

### Curriculum

The Machine Tool Operation Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 34 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-106	Intro to College Math	3
31-420-304	CNC Fundamentals 1	3
31-420-345	Machine Shop 1	4
31-420-346	Machine Shop 2	4
31-420-348	Precision Measurement	1
31-420-358	CNC Set-Ups	1
31-421-352	Blueprint Rdg/Sket-Mach 1	2
<b>Semester Total</b>		<b>18</b>

#### Second Semester

31-420-347	Cutting Tool Technology	1
31-420-349	CNC Fundamentals 2	3
31-420-356	Machine Shop 3	4
31-420-357	Machine Shop 4	4
31-421-362	Blueprint Rdg/Sket-Mach 2	2
31-422-359	Metallurgy for Machinist	1
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>34</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**31-420-304 CNC FUNDAMENTALS 1** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, and fundamental programming of computer numerically controlled (CNC) milling machines. (Prerequisite: Basic Windows Proficiency)

**31-420-345 MACHINE SHOP 1**...shop safety, measuring tools/layout, power saw theory/operation, basic theory, operation of drilling machines, bench work, basic engine lathe operation, basic vertical, horizontal, CNC milling machine, surface grinder.

**31-420-346 MACHINE SHOP 2** ...safety, measuring tools/layout, powersaw operation, drilling machine operation basic/theory and operation of engine lathes, basic theory/operation vertical/horizontal milling machines; CNC milling, lathe operation, surface grinder operations. (Corequisite: 31-420-345, Machine Shop 1)

**31-420-347 CUTTING TOOL TECHNOLOGY** ...tool materials, tool geometry, lathe tools, milling cutters, cutting speeds/feeds, drills, reamers, taps, threading tools, carbide inserts, and diamond, ceramic, Cermet and polycrystalline cutting tools.

**31-420-348 PRECISION MEASUREMENT** ...how to read/measure english and metric, rules, squares surface plates, micrometers, vernier calipers, height measuring instruments, gage blocks, angular measurement, go-no-go gages, comparison measurement; surface finish measurement. (Corequisite: 31-420-358, CNC Set Ups)

**31-420-349 CNC FUNDAMENTALS 2** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, fundamental programming of computer numerically controlled (CNC) milling machines, and CNC turning centers. (Prerequisite: 31-420-304, CNC Fun 1)

**31-420-356 MACHINE SHOP 3** ...shop safety, measuring tools/layout, power saws, drilling machine operation, intermediate engine lathed operation and vertical horizontal, CNC milling machine operation, theory/operating grinding machines, operating CNC turning centers. (Prerequisite: 31-420-346, Machine Shop 2)

**31-420-357 MACHINE SHOP 4** ...shop safety, measuring tools, power saw operation, drilling machines, bench work and maintenance, advanced engine lathe operation, advanced vertical horizontal and CNC milling operation, grinding machine operation, and CNC turning centers. (Corequisite: 31-420-356, Machine Shop 3)

**31-420-358 CNC SET-UPS** ...CNC mill and lathe-tool holder selection, loading and unloading tools, work holding, setting part zero, fixture offsets, setting length and dial offsets, boring bars, and bar feeding. (Corequisite: 31-420-348, Prec Msmt)

**31-421-352 BLUEPRINT READING/SKETCHING-MACHINE 1** ...fundamentals of sketching, orthographic projection, auxiliary views, sectional views, dimensioning, precision and non-precision measurement, and general print reading.

**31-421-362 BLUEPRINT READING/SKETCHING-MACHINE TRADES 2** ...blueprint reading, tolerancing, surface finishes, fits (inch & metric), basic welding symbols, casting, stamping, gearing and CAM drawings, and basic geometric tolerancing and dimensioning. (Prerequisite: 31-421-352, Blueprint Reading Sketching-Machine Trades I)

**31-422-359 METALLURGY FOR MACHINIST** ...manufacture of iron and steel, basic composition of metals, metal identification, applied heat treating processes.



# Machine Tool Technics (Tool & Die Making)

Program Code 324205

## Technical Diploma

Offered at the Marinette campus.

For information: (715) 735-9361. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

A second year of advanced Machine Tool CNC Technician, tool and die, and electrical discharge machining for graduates of the Machine Tool Operation Program.

### Program Outcomes

- Set-up and operate milling machines.
- Know and apply Statistical Process Control (SPC).
- Set-up and operate computerized electrical discharge machines.
- Design and construct jigs, fixtures, dies and molds.
- Set-up and operate grinding machines.
- Set-up and operate sawing machines.
- Set-up and operate drilling machines.
- Complete basic welding processes.
- Use precision measuring practices.
- Program and operate computerized numerical control milling machines.
- Program and operate computerized numerical control lathes.
- Identify fluid power components.
- Know and apply ISO 9000 quality practices.
- Know and apply mathematics.
- Set-up and operate engine lathes.
- Interpret working drawings.
- Work from blueprints and sketches.
- Know and apply basic metallurgy.
- Know and apply shop safety practices.
- Understand and apply cutting tool speeds and feeds.
- Perform 2-D CAM operations.
- Program 3-D surface machining operations.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic familiarity with Microsoft windows.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**CNC Operator:** sets up and operates computer numerical controlled machine tools working from blueprints and set-up sheets; sets up fixturing and tooling; produces and inspects parts; and edits CNC programs on CNC lathes and machining centers.

**Jig and Fixture Apprentice/Trainee:** lays out, fits, and assembles parts to make and repair cutting tools, jigs, fixtures, gauges, or machinist's hand tools by analyzing specifications.

**Machine Set-Up Operator:** sets up and operates a variety of machine tools such as radial drill presses, lathes, milling machines, and grinders; machines metal work pieces such as patterns and machine tool or die parts, usually on a custom basis; analyzes specifications; and determines tooling.

**Machinist Apprentice/Trainee:** sets up and operates machine tools and fits and assembles parts to make or repair metal parts, mechanisms, tools, or machines.

**Maintenance Machinist:** sets up and operates a variety of machine tools; and fits and assembles parts to fabricate or repair machine tools and to maintain industrial machines.

**Mold Maker Apprentice/Trainee:** lays out, machines, fits, assembles, and finishes metal products and metal molds for injection or compression molding of plastic or rubber products.

**Tool and Cutter Grinder:** sets up and operates cutter grinding machines used for sharpening tools and cutters that are needed in the manufacturing industry; and inspects resharpened tooling.

**Tool and Die Apprentice/Trainee:** lays out, machines, fits, assembles, and finishes specialized cutting tools used in the mold and die industry as well as dies used in cutting, stamping, and forging processes.

**Electrical Discharge Machining (EDM) Operator:** sets up and uses Ram or wire EDM machines to manufacture punches, dies, molds, and production parts.

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

- All-Around Machinist
- Journey Level Machinist
- Pattern Maker
- Mold Maker
- Tool and Die Maker
- CNC Programmer
- Machine Shop Foreperson/Supervisor

### Curriculum

The Machine Tool Technics (Tool & Die Making) program is a two-year, four-semester program.

Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-106	Intro to College Math	3
31-420-304	CNC Fundamentals 1	3
31-420-345	Machine Shop 1	4
31-420-346	Machine Shop 2	4
31-420-348	Precision Measurement	1
31-420-358	CNC Set-Ups	1
31-421-352	Blueprint Rdg/Sket-Mach 1	2
<b>Semester Total</b>		<b>18</b>

#### Second Semester

31-420-347	Cutting Tool Technology	1
31-420-349	CNC Fundamentals 2	3
31-420-356	Machine Shop 3	4
31-420-357	Machine Shop 4	4
31-421-362	Blueprint Rdg/Sket-Mach 2	2
31-422-359	Metallurgy for Machinist	1
31-801-385	Communicating-Writing	1
<b>Semester Total</b>		<b>16</b>

#### Third Semester

31-442-361	Welding-Machine Trades	1
32-420-300	Mold Die Construction	4
32-420-301	Tool Making	4
32-420-302	Mold Die Design	2
32-420-303	Tooling Design	2
32-420-337	CNC Fundamentals 3	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-809-197	Contemporary Amer Society	3
32-420-304	Stamping Die Design	2
32-420-305	Machine Applications-Advanced	4
32-420-306	Stamping Die Construction	4
32-420-307	Machining Theory-Advanced	2
32-420-308	Metrology	1
32-420-342	CNC Fundamentals 4	2
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.



## 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](http://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.*

**31-420-304 CNC FUNDAMENTALS 1** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, and fundamental programming of computer numerically controlled (CNC) milling machines. (Prerequisite: Basic Windows Proficiency)

**31-420-345 MACHINE SHOP 1** ...shop safety, measuring tools/layout, power saw theory/operation, basic theory, operation of drilling machines, bench work, basic engine lathe operation, basic vertical, horizontal, CNC milling machine, surface grinder.

**31-420-346 MACHINE SHOP 2** ...safety, measuring tools/layout, powersaw operation, drilling machine operation basic/theory and operation of engine lathes, basic theory/operation vertical/horizontal milling machines; CNC milling, lathe operation, surface grinder operations. (Corequisite: 31-420-345, Machine Shop 1)

**31-420-347 CUTTING TOOL TECHNOLOGY** ...tool materials, tool geometry, lathe tools, milling cutters, cutting speeds/feeds, drills, reamers, taps, threading tools, carbide inserts, and diamond, ceramic, Cermet and polycrystalline cutting tools.

**31-420-348 PRECISION MEASUREMENT** ...how to read/measure english and metric, rules, squares surface plates, micrometers, vernier calipers, height measuring instruments, gage blocks, angular measurement, go-no-go gages, comparison measurement; surface finish measurement. (Corequisite: 31-420-358, CNC Set Ups)

**31-420-349 CNC FUNDAMENTALS 2** ...computer controlled milling machines, basic programming operations on computer aided manufacturing (CAM) systems, fundamental programming of computer numerically controlled (CNC) milling machines, and CNC turning centers. (Prerequisite: 31-420-304, CNC Fun 1)

**31-420-356 MACHINE SHOP 3** ...shop safety, measuring tools/layout, power saws, drilling machine operation, intermediate engine lathed operation and vertical horizontal, CNC milling machine operation, theory/operating grinding machines, operating CNC turning centers. (Prerequisite: 31-420-346, Machine Shop 2)

**31-420-357 MACHINE SHOP 4** ...shop safety, measuring tools, power saw operation, drilling machines, bench work and maintenance, advanced engine lathe operation, advanced vertical horizontal and CNC milling operation, grinding machine operation, and CNC turning centers. (Corequisite: 31-420-356, Machine Shop 3)

**31-420-358 CNC SET-UPS** ...CNC mill and lathe-tool holder selection, loading and unloading tools, work holding, setting part zero, fixture offsets, setting length and dial offsets, boring bars, and bar feeding. (Corequisite: 31-420-348, Prec Msmt)

**31-421-352 BLUEPRINT READING/SKETCHING-MACHINE 1** ...fundamentals of sketching, orthographic projection, auxiliary views, sectional views, dimensioning, precision and non-precision measurement, and general print reading.

**31-421-362 BLUEPRINT READING/SKETCHING-MACHINE TRADES 2** ...blueprint reading, tolerancing, surface finishes, fits (inch & metric), basic welding symbols, casting, stamping, gearing and CAM drawings, and basic geometric tolerancing and dimensioning. (Prerequisite: 31-421-352, Blueprint Reading Sketching-Machine Trades I)

**31-422-359 METALLURGY FOR MACHINIST** ...manufacture of iron and steel, basic composition of metals, metal identification, applied heat treating processes.

**31-442-361 WELDING-MACHINE TRADES** ...oxyacetylene, brazing, soldering, cutting and hardsurfacing, beads and types of joints, plasma arc cutting, gas metal arc, tungsten metal arc welding.

**32-420-300 MOLD DIE CONSTRUCTION** ...squaring plates, boring/milling/turning components, grinding/polishing operations, heat treating, fitting ejector systems, heating/cooling systems, applying fasteners, engraving/stamping, RAM EDM machining, molding machine setup. (Prerequisite: Completion of 1st and 2nd semester courses.)

**32-420-301 TOOL MAKING** ...performing various machining, heat-treating, and assembly operations necessary to produce a tool or fixture to be used in a typical manufacturing process. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-302 MOLD DIE DESIGN** ...interpret mold die prints, types of mold dies; identify mold plates, ejector pins, return pins, sprues, slides, cavities, runners, gates, leader pins/bushings; select material to be molded and design a mold die. (Prerequisite: Completion of 1st and 2nd semester courses.)

**32-420-303 TOOLING DESIGN** ...interpreting tool and fixturing prints, designing a tool or fixture to be used in a typical manufacturing process. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-304 STAMPING DIE DESIGN** ...interpret stamp die prints, types of stamp dies; identify die blocks, punches, punch plates, gages, stops, strippers, die shoes; design stamp die. (Prerequisites: 32-420-303, Tooling Design; 32-420-301, Tool Making; basic Windows proficiency)

**32-420-305 MACHINE APPLICATIONS-ADVANCED** ...maintain/set-up/operate CNC wire/RAM EDM machines, simulate high-speed machining processes, apply superabrasive tooling, 4th axis milling operations, 3 axis turn/mill/drill applications, 3-D surface machining. (Prerequisite: Completion of 1st and 2nd semester courses.)

**32-420-306 STAMPING DIE CONSTRUCTION** ...machine die blocks, punches, punch plates, gages, stops, strippers, die shoes using CNC lathes, CNC mills, CNC wire EDM; assemble components into a working die set; set-up on punch press. (Prerequisites: 32-420-303, Tooling Design; 32-420-301, Tool Making)

**32-420-307 MACHINING THEORY-ADVANCED** ...electrical discharge machining (EDM), high speed machining concepts, rapid setup and quick change over procedures, abrasive waterjet, abrasive flow, chemical machining, laser and plasma, palletizing systems. (Prerequisite: Completion of 1st and 2nd semester courses)

**32-420-308 METROLOGY** ...ISO 9000 concepts, Statistical Process Control (SPC) theory and applications, coordinate measuring machine setup and applications, surface texture measurement concepts, and applications for geometric dimensioning and tolerancing (GD&T), optical comparator and high amplification techniques. (Prerequisite: 31-420-348, Precision Measurement)

**32-420-337 CNC FUNDAMENTALS 3** ...basic AutoCAD, CNC production planning, advanced 2D programming, 3D surface programming, computer assisted CNC programming. (Prerequisite: 31-420-349, CNC Fundamentals 2)

**32-420-342 CNC FUNDAMENTALS 4** ...CNC process modeling, 4th axis indexing, advanced CNC lathe programming, 4th axis CNC wire EDM programming, and CNC fabrication punch/turner programming applications. (Prerequisite: 32-420-337, CNC Fundamentals 3)



# Manufacturing Engineering Technology

Program Code 106233

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Manufacturing Engineering Technology program prepares students to work in the manufacturing sector assisting engineering and management in the design and development of new products and in the improvement of production processes.

This program has been developed to transfer into University of Wisconsin-Stout's Bachelor of Science degree in Manufacturing Engineering. The third and fourth years of the bachelor's program will be taught by UW-Stout instructors on the NWTC Green Bay campus with no need for students to travel to UW-Stout.

### Program Outcomes

- Apply the principles of mathematics and science to solving manufacturing related problems.
- Apply methodologies to design for manufacturability.
- Determine production process improvements by conducting experiments.
- Create basic models using a parametric modeler.
- Explain the principles of material selection.
- Assist in the design of products and manufacturing systems.
- Communicate effectively.
- Function effectively in team or group settings.
- Display attitudes consistent with the profession.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have an aptitude for science and mathematics. Students should take as many upper level math and science courses in high school as possible, including mathematics through algebra, trigonometry and pre-calculus, and physics and chemistry.
- Students will also need to have mastered basic computer skills and should have had experience with manual drafting or sketching.
- Students will be required to take the UW Math Placement Exam. Students must place into UWGB MATH 202 in order to take UWGB Calculus and Analytical Geometry 1. Students who place lower than UWGB MATH 202, will need to begin with another math course before taking Calculus. Students can take the UW Math Placement Exam at the NWTC Assessment Center. Please consult with your NWTC Academic Advisor.

### Employment Potential

A graduate of the program will have the potential for employment in the manufacturing sector as a Manufacturing Engineering Technician, Industrial Engineering Technician, Productivity Improvement Technician or Continuous Improvement Technician, assisting engineering and management in the design and production of products as efficiently as possible.

### Note

**The following courses will be taken at UW-Green Bay:**

MATH 202	Calculus and Analytic Geometry I
MATH 203	Calculus and Analytic Geometry II
CHEM 211	Principles of Chemistry I
PHYSICS 201	Principles of Physics I
PHYSICS 202	Principles of Physics II

Students enrolling in these courses under the terms of this agreement must meet all of UW-Green Bay's admission requirements and the specific course pre-requisites as published in the UW-Green Bay Undergraduate Catalog and have been admitted to the NWTC Manufacturing Engineering Technology Program. All requirements and fees for enrollment at UW-Green Bay will apply and are subject to change.

- Please see your NWTC Academic Advisor for UW-Green Bay Admission information.
- Additional course work may be required during summer terms for transfer to UW-Stout.

### Alternatives for Program Entry

#### May Include A, B or C:

- A.** Rank in the top 40 percent of your class with a minimum ACT math score of 22.
- B.** Score a minimum composite ACT score of 22 with a minimum ACT math score of 22.
- C.** Earn a cumulative grade point average of 3.0 on a 4.0 scale with a minimum ACT math score of 22.

### Curriculum

The Manufacturing Engineering Technology Associate Degree is a two-year program. Upon graduation students will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-623-170	Engineering Materials - Intro	3
10-801-136	English Composition 1	3
10-801-198	Speech	3
10-804-202	UWGB-Calculus_Analytic Geom I	4
10-806-211	UWGB-Princ of Chemistry I	5
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-623-175	Casting and Joining Processes	3
10-801-185	English Composition 2	3
10-804-203	UWGB-Calc_Analytic Geom II	4
10-806-201	UWGB-Principles of Physics I	5
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-606-113	CAD	2
10-623-171	Polymer Composite Processes	3
10-623-173	Engineering Mechanics	3
10-806-202	UWGB-Prin of Physics II	5
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

10-606-126	Geometric Dimension/Toleran	2
10-606-157	Solidworks Fund and Drawings	2
10-623-172	Material Removal/Forming	3
10-623-174	Mechanics of Materials	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

### 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](http://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.*

#### 10-606-113 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. (Corequisite: 10-607-119, Civil Drafting Technology OR 10-606-119, Technical Sketching OR 10-614-113, 2D Essentials)

#### 10-606-126 GEOMETRIC DIMENSIONING/TOLERANCING

...review of standard dimensioning, datums, material condition symbols, tolerances of form and profile, tolerances of orientation and run out, location tolerances and virtual condition. (Prerequisite: 10-606-113, CAD; OR 10-606-157, Solidworks Fund and Drawings OR 10-606-162, Solidworks Fundamentals)

#### 10-606-157 SOLIDWORKS FUNDAMENTALS AND DRAWINGS

...terminology, software operation and interface basics, creating basic models, creating casting and forging models, revolved features, Solidworks drawing environment and fully dimensioned orthographic drawings. (Corequisite: 10-606-119, Sketching-Technical, OR 10-614-113, 2D Essentials Sketching-Technical; Prerequisite: Familiarity with Windows file management.)

#### 10-623-170 ENGINEERING MATERIALS - INTRO

...exposure to engineering materials, their properties, and behavior. Topics will include: material types, material testing, mechanical properties, heat treatment and materials selection. (Prerequisite: Math level pre-calculus)

#### 10-623-171 POLYMER AND COMPOSITE PROCESSES

...polymer materials and properties, material testing, product design and evaluation, processing methods, machine setup and operation. (Prerequisite: 10-623-170, Engineering Materials-Intro)

#### 10-623-172 MATERIAL REMOVAL AND FORMING PROCESSES

...machine tool concepts providing an operational knowledge of machining and metal forming processes. Analysis and application of primary and secondary processing methods for the manufacture of products. Measurement principles and practice applied to inspection and process control. Development of process designs appropriate for product specifications. (Prerequisite: 10-623-170, Engineering Materials-Intro)



**10-623-173 ENGINEERING MECHANICS** ...force systems and equilibrium in two and three dimensions, free body diagrams, trusses, frames, friction, kinematic analysis of particle and rigid body translation, rotation, and general plane motion, force-acceleration analysis, work-energy analysis, impulse momentum analysis, impact, damped and undamped vibrations, and forced vibrations. (Prerequisite: Physics 201, Principles of Physics I)

**10-623-174 MECHANICS OF MATERIALS** ...stress and strain, stress-strain curves, material properties, stress and strain transformation, axially loaded members, elastic and inelastic flexure, shear and bending moment diagrams, beam deflections, combined loading, fatigue, column buckling. (Prerequisite: 10-623-173, Engineering Mechanics)

**10-623-175 CASTING AND JOINING PROCESS** ...welding of metals, ceramic and plastic. Brazing and soldering of appropriate metals, setup and operate welding equipment. Thermal effects and destructive testing. Evaluation of adhesives and mechanical fasteners. Welding codes and ASTM standard comparative processing cost. (Prerequisite: 10-623-170, Engineering Materials-Intro)

# Marketing

Program Code 101043

## Associate Degree

Offered at the Green Bay campus. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Marketing prepares students to perform basic marketing functions in industrial, wholesale, retail, and service areas. Specific areas of study are sales, promotion principles, market research, and customer service.

### Program Outcomes

- Recommend a pricing plan.
- Evaluate alternative distribution strategies.
- Develop a product and service mix.
- Generate marketing information for effective decision making.
- Apply continuous improvement strategies to solve marketing problems.
- Assess emerging trends in global trade that impact business and marketing.
- Create a personal professional development plan.
- Manage resources and risks to contribute to profitability of the organization.
- Manage marketing within an enterprise.
- Apply technology to marketing and marketing information systems.
- Apply legal and ethical principles to personal, social, and professional behaviors.
- Develop long-term strategic marketing plans.
- Formulate selling strategies.
- Apply effective leadership skills.
- Design a promotion plan.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Ability to use computer keyboard.
- Students should have mastered basic math skills. For a description of basic math, see Basic Education.

### Employment Potential

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

**Customer Service Representative:** initiates follow-up work with current customers, processes and tracks customer orders, acts as an internal contact for customer inquiries as well as a liaison to field sales organizations, and uses telecommunications skills extensively.

**Marketing Assistant:** assists department head by performing similar duties; directs and coordinates department activities and functions in commercial, industrial, or service establishments; reviews and analyzes reports, records, and directives; confers with supervisory personnel; and performs administrative tasks such as pricing schedules.

**Marketing Research Assistant:** researches market conditions to determine potential sales of product or service, examines and assists in analyzing data to forecast future marketing trends, and prepares reports and graphic illustrations of findings.

**Sales Promotion Coordinator:** develops a calendar of promotional events, analyzes media utilization, reviews media rates and cost effectiveness, performs follow-up detail work on promotion implementation, coordinates internal communication, and develops internal promotional support material.

**Sales Representative:** sells mainly to other businesses such as factories, wholesalers, retailers, and institutions; sells business, financial, and consumer products and services; sets up displays; visits customers; does paperwork; writes correspondence; and studies literature relating to products.

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

- Business Owner
- Customer Service Manager
- Insurance Agent
- Marketing Manager
- Promotions Manager
- Real Estate Salesperson
- Sales Manager

### Curriculum

The Marketing Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-102-158	Business-Intro	3
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-141	Micro: Access-Intro	1
10-104-101	Selling Principles	3
10-104-110	Marketing Principles	3
10-801-195	Written Communication	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-104-107	Marketing Comm-Integrated	3
10-104-124	Marketing Presentations	1
10-104-191	Customer Service Mgmt	3
10-104-198	Market Research	3
10-801-198	Speech	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-101-106	Accounting-for Non-Accountants	3
10-104-120	Marketing Info Mgmt	3
10-104-176	Consumer Behavior-Mktg	3
10-809-103	Think Critically & Creatively	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-102-150	Law-Business	3
10-104-119	E-Business Web Marketing	3
10-104-125	Event Marketing	3
10-104-134	Marketing Internship	3
OR		
10-104-140	Marketing Field Study	3
10-104-189	Sales Management	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>67</b>

This program is fully eligible for financial aid.



### 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](http://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.*

#### 10-101-106 ACCOUNTING: INTRO FOR NON-

**ACCOUNTANTS** ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

**10-102-150 LAW-BUSINESS** ...common law contracts and sales contracts: formation, interpretation, performance, and discharge; the law of agency; corporations; and introduction to the American legal system: criminal and tort law, and global business issues.

**10-102-158 BUSINESS-INTRODUCTION** ...organization/management process of human resources, production, operations, marketing, distribution, and finances; risk management; ethics/legalistic management; international business; accounting, computers, and data processing.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-104-101 SELLING PRINCIPLES** ...selling as a career; success factors in selling; personality development; product knowledge; and the sales process involving preparation, approach, presentation-demonstration, handling objections, and closing the sale successfully.

**10-104-107 MARKETING COMMUNICATIONS-INTEGRATED** ...creating, coordinating and integrating advertising, public relations and marketing activities for a specific customer or audience. A campaign will be developed and presented.

**10-104-110 MARKETING PRINCIPLES** ...marketing management, market segmentation, market research, consumer behavior, product decisions and management of distribution, pricing, promotional decisions for strategy planning.

**10-104-119 E-BUSINESS WEB MARKETING** ...traditional and electronic direct marketing strategies; methods include search engine management, direct marketing planning, database marketing, catalogs, telemarketing services, print, radio, television and direct mailing. (Prerequisite: 10-104-110, Marketing Principles)

**10-104-120 MARKETING INFORMATION MANAGEMENT** ...opportunity analysis, marketing research processes and data sources, forecasting sales of new and established products, master plan for a marketing strategy, and implementation and control of marketing programs.

**10-104-124 MARKETING PRESENTATIONS** ...the use of Microsoft PowerPoint as a tool to create effective, professional-looking marketing presentations.

**10-104-125 EVENT MARKETING** ...planning, promotion execution, and evaluation of special events (entertainment, industry, meeting/convention). Students will work toward the actual staging of an event (will require time outside of the classroom setting).

**10-104-134 MARKETING INTERNSHIP** ...training in an appropriate setting through actual work experience and observation.

**10-104-140 MARKETING FIELD STUDY** ...alternative to the internship: in-depth study of an industry, business, career, or project.

**10-104-176 CONSUMER BEHAVIOR-MKTG** ...motivation and personality, information processing, life styles, group influences, post-purchase behavior, and other behaviors related to marketing.

**10-104-189 SALES MANAGEMENT** ...sales-force organization, staffing, and operations; recruiting and processing applicants; training programs; motivating; compensation; forecasting and budgeting; territories and routing; quotas; evaluating performance; and decision-making through case study analysis.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-104-198 MARKET RESEARCH** ...identifying problems and formulating problem hypothesis, situation analysis, informal investigation and secondary research, project objectives, primary research, sampling, questionnaires, interviews, processing the written report, and conclusions and data analysis.

# Marketing and Graphic Communications

Program Code 101117

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Marketing and Graphic Communications trains students in Graphic Design, Digital Print Media and Web. Students complete a portfolio review session with the instructional team during each semester.

### Program Outcomes

- Conduct integrated marketing plan.
- Implement promotional strategies.
- Create and design for print/web.
- Assemble and manage a design portfolio.
- Perform electronic prepress operations.
- Operate printing equipment.
- Manage color separations and digital print output.
- Perform digital publishing operations.
- Implement typography strategies.
- Design web pages.
- Complete 144 hours of internship work experience in the field.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Ability to use computer keyboard.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Desktop Publisher:** produces professional publications using electronic publishing software, scans graphic images, places text and graphics files onto the page, and operates image setters.

**Graphic Designer:** develops advertising concepts and prepares art for the final printed piece.

**Advertising Assistant:** works with the ad director or store manager to plan and prepare advertising for print, radio, and TV use.

**Commercial Art Worker:** prepares artwork and copy to be used in label production, package design, printed materials; prepares process separations; preflights electronic files; manages color control; and manages fonts.

**Digital Print Technician:** prepares computer files for variable data printing or produce print on demand applications.

**Layout Designer:** designs basic plans for print advertising, passes on work to a commercial artist or copywriter, and is responsible for final electronic files.

### Printing Support Worker/Customer Service Representative

handles electronic and pre-press operations, making color separations, electronic scanning, image editing, and color proofing.

**Public Relations Assistant:** assists in public relations activities helping to produce brochures, press releases, displays, and newsletters; organizes and prepares materials for use in presentations in the form of handouts, slide art/copy, transparencies, and charts.

**Pre-Press Technician:** prepares computer documents for printing; trapping, font usage, picture usage, color management, clipping paths, and placing high and low resolution graphics into document.

**Website Designer:** builds graphic elements for functional websites.

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

- Account Executive
- Art Director
- Design Supervisor
- Media Buyer

### Curriculum

The Marketing and Graphic Communications Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-111-101	Macintosh-Image Editing	3
10-111-103	Graphic Workstations	1
10-111-120	Macintosh Publishing	3
10-111-161	Macintosh Illustration	3
10-204-110	Publishing Technologies	3
10-809-103	Think Critically & Creatively	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-111-111	Marketing 1-Visual Design	3
10-111-125	Graphic Reproduction Tech	3
10-111-159	Graphic Workstations-Adv	3
10-111-162	Typography Design/Paper	2
10-152-185	Website Coding	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-111-121	Marketing 2-Visual Design	3
10-111-142	Graphic Reproduction-Adv	2
10-111-150	Web Graphic Design	3
10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-104-107	Marketing Comm-Integrated	3
10-104-191	Customer Service Mgmt	3
10-111-141	Marketing Comm Internship	3
10-204-126	Digital Print Applications	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

### Note

- Graphic Workstations class is a corequisite to any first semester course in the Marketing and Graphic Communications program.
- It is also recommended that learners take the Marketing and Graphic Communications Internship course (10-111-141) in their last semester.

### 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](http://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.*

**10-104-107 MARKETING COMMUNICATIONS-INTEGRATED** ...creating, coordinating and integrating advertising, public relations and marketing activities for a specific customer or audience. A campaign will be developed and presented.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-111-101 MACINTOSH-IMAGE EDITING** ... (Adobe Photoshop + Adobe Acrobat) scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print. An introduction to manipulating bitmap images. (Corequisite: 10-111-103, Graphic Workstations)

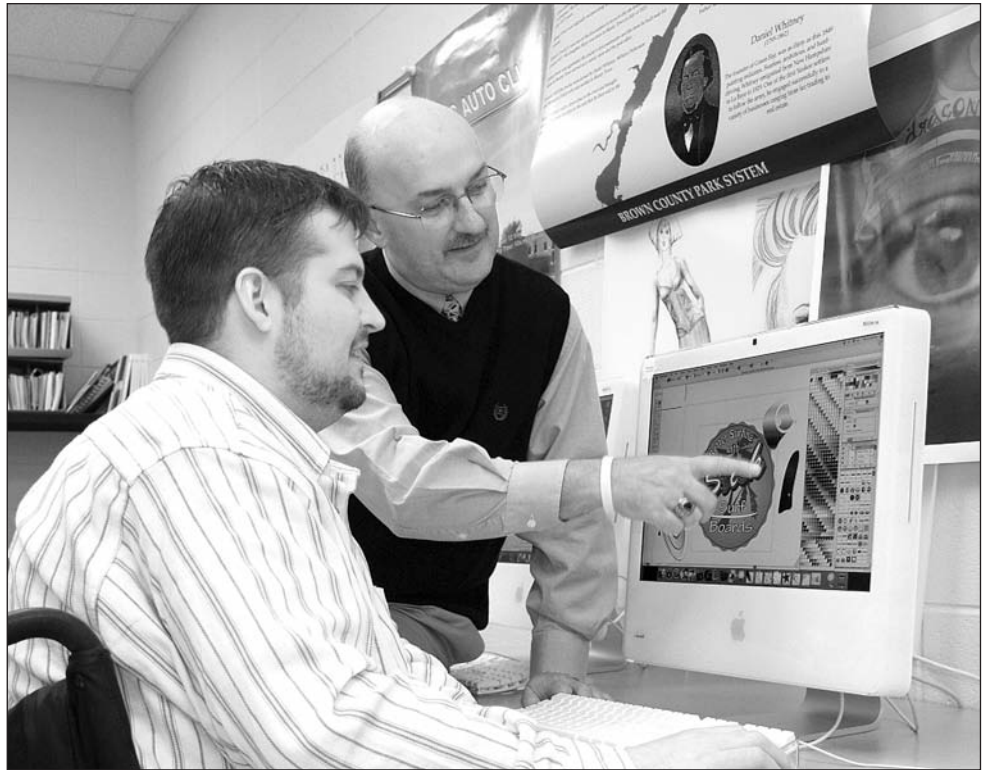
**10-111-103 GRAPHIC WORKSTATIONS** ...explore the Macintosh Operating System and applications including iPhoto, iTunes, iMovie, GarageBand, FontBook, Sherlock, iCal, AddressBook and Dashboard. Learn to navigate the Mac Operating System and manage files and folders.

**10-111-111 MARKETING 1-VISUAL DESIGN** ...design and drawing for graphic reproduction, design trends, and applications; brochure, advertising, and corporate I.D. package created using basic design process of thumbnails, rough, and comprehensive layout. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-120 MACINTOSH PUBLISHING** ...develop page layout concepts utilizing document files, tools, guides, objects and shapes, text, colors, style sheets, images, master pages; manage output for printing; and apply copy elements. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-121 MARKETING 2-VISUAL DESIGN** ...apply basic design techniques to an advertising campaign, illustration techniques, lettering and typography, reproducing logos for print production, color for advertising, and preparation of a professional portfolio. (Prerequisite: 10-111-103, Graphic Workstations)

**10-111-125 GRAPHIC REPRODUCTION TECHNIQUES** ...basic process of reproducing images using offset lithography including electronic imaging, preflighting, trapping concepts, imposition, and collect for output. (Prerequisites: 10-111-103, Graphic Workstations; 10-111-120, Macintosh Publishing)



**10-111-141 MARKETING COMMUNICATIONS INTERNSHIP** ...classroom experience with on-the-job training concluding with an evaluation by employer and instructor. Course should be taken during the final semester.

**10-111-142 GRAPHIC REPRODUCTION-ADVANCED** ...various techniques used to print four-color process images including traditional and electronic separations; trapping, creating pdf's, proofing techniques; color correction; preparing files for flexo, gravure, and screen printing. (Prerequisite: 10-111-103, Graphic Workstations)

**10-111-150 WEB GRAPHIC DESIGN** ... (Adobe Photoshop) design and prepare graphics for the web including graphics for backgrounds, rollover effects, navigation, and badges. Also includes techniques for optimization and transparency. (Prerequisites: 10-111-101, Macintosh Image Editing; 10-152-185, Website Coding)

**10-111-159 GRAPHIC WORKSTATIONS-ADVANCED** ...operation of production systems, applications used in graphic design/multimedia industries; OSX (Ten) operating system, directory structure, file management, application operation; cross platform file usage/delivery. (Prerequisite: 10-111-103, Graphic Workstations)

**10-111-161 MACINTOSH ILLUSTRATION** ...create and paint basic shapes, draw, transform objects, work with type, blend shapes and colors, work with layers, special effects, and color separations. An introduction to manipulating vector based images. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-162 TYPOGRAPHY DESIGN/PAPER** ...typography history; type styles and nomenclature; type in design world; type usage in printing; paper nomenclature; paper types; papers used for art, printing, and industry; and future of paper. (Prerequisite: 10-111-103, Graphic Workstations)

**10-152-185 WEBSITE CODING** ...write code for functionality and design of web page text, hyperlinks, images, tables, and forms using (X)HTML and CSS. Apply and validate coding standards. Test browser function and user accessibility.

**10-204-110 PUBLISHING TECHNOLOGIES** ...introduction to printing process, electronic publishing, prepress operations, press operations, postpress operations, job logs, professional portfolios, and job seeking skills. (Corequisite: 10-111-103, Graphic Workstations)

**10-204-126 DIGITAL PRINT APPLICATIONS** ...explain why the industry is in a state of transition towards digital printing, outline the proper time to select digital printing as a production tool; what type of project fits well into a digital print environment, identify what type of project fits the mold of digital printing.



# Mechanical Design Technology

Program Code 106061

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Mechanical Design Technology prepares learners for employment as machine designers. Mechanical design technicians assist product engineers by detailing sections of the design. Detailing includes selecting standard parts such as bearings, couplings, and fasteners; sizing machine members; and preparing necessary documentation for detail and assembly drawings. Most of the work is done on a computer.

### Program Outcomes

- Draw principal, auxiliary, and sectional views.
- Use mechanical, architectural, metric, and civil scales to plot scalable prints of drawings.
- Research information on the Internet.
- Maintain files on a personal computer.
- Operate word processing and spreadsheet programs.
- Analyze displacement, velocity, and acceleration of machine members.
- Analyze stresses caused by forces acting on bodies at rest.
- Analyze forces acting on bodies at rest.
- Sketch orthographic and isometric views.
- Use catalogs or Internet sites to select standard components in machine design.
- Dimension mechanical drawings according to conventional ANSI Y14 standards and GDT standards.
- Draw weldments and sheetmetal layouts.
- Draw layouts.
- Calculate gear train ratios.
- Create basic models using a parametric modeler.
- Design simple mechanical devices.
- Draw detail and assembly drawings.
- Prepare electrical/electronic documentation for machine control.
- Construct ladder diagrams for motor controls documentation.
- Display attitudes consistent with the profession.
- Work in an organized manner, documenting work performed.
- Use Machinery's Handbook as a reference source.
- Apply various manufacturing methods and techniques as they relate to mechanical design.
- Identify the characteristics of metals, polymeric, ceramics, and composites.
- Evaluate material options for machine components.
- Select materials for machine components.

### Employment Potential

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

**Detailer:** produces detailed drawings of parts of machines from supplied information on CAD, and makes drawing changes to comply with Engineering Change Notices (ECN's)/Engineering Change Requests (ECR's).

**Mechanical Design Technician:** applies knowledge of mechanical engineering technology to design, develop, and test new or revised machinery; assists in component selection and sizing of machine members; has duties split between design and drafting and may specialize in a specific type of machine or product. Most work is performed on a computer.

**Mechanical Drafter:** has the principal duty of preparing working drawings of machinery and mechanical devices using CAD systems to draft detail and assembly drawings indicating dimensions and tolerances, materials, surface finishes, joining requirements, and other engineering data.

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

- Mechanical Designer (Product Designer)
- Lead Designer
- Project Engineer
- Technical Sales/Service Representative

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Mechanical Design Technology on the College Math assessment is 50.
- A high school background in mathematics, science and industrial education.
- High school algebra or equivalent.
- The student will either provide proof of having completed course work in Windows, Word, and Excel or pass a proficiency test.

### Curriculum

The Mechanical Design Technology Associate Degree is a two-year program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-606-111	Mechanical Design-Exploring	1
10-606-113	CAD	2
10-606-157	Solidworks Fund and Drawings	2
10-614-113	2D Essentials	2
10-801-196	Oral/Interpersonal Comm	3
10-804-118	Interm Algebra w Apps	4
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-442-153	Prototype Metal Fabrication	2
10-606-103	2D CAD - Advanced	3
10-606-122	CAD-Fabrication & Assembly	2
10-606-126	Geometric Dimension/Toleran	2
10-804-196	Trigonometry w Apps	3
10-806-154	General Physics 1	4
<b>Semester Total</b>		<b>16</b>

#### Third Semester

10-420-115	CNC-Mechanical Design	3
10-606-135	Machine Members-Strength	5
10-606-139	CAD-Electrical Control	3
10-606-158	Solidworks Advanced	3
10-606-159	Materials Science	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-606-141	Design Problems	3
10-606-143	Mechanisms	3
10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
10-620-165	Fluids 3: Inter Hydraulics	1
10-801-195	Written Communication	3
10-809-172	Race Ethnic & Diversity Elective	3
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>68</b>

#### Suggested Electives:

10-660-104, DC 1: Introduction  
10-660-105, DC 2: Circuits  
10-660-107, AC 1: Properties

This program is fully eligible for financial aid.

## 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](http://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.*

**10-420-115 CNC-MECHANICAL DESIGN** ...2 axis CNC; 3 axis CNC; importing files; mold making. (Prerequisites: 10-606-113, CAD; 10-606-157, Solidworks Fund and Drawings)

**10-442-153 PROTOTYPE METAL FABRICATION** ...ferrous and non-ferrous metals, oxyacetylene gas, tungston arc, gas metal arc, and metal fabrication. (Corequisite: 10-606-122, CAD Fab & Assembly; OR 10-614-122, Prototype Design)

**10-606-103 2D CAD-ADVANCED** ...primary and successive auxiliary views; intersections and developments; intersections of planes and dihedral angles; piercing points; angles between lines and planes; revolutions; vectors. (Prerequisite: 10-606-113, CAD.)

**10-606-111 MECHANICAL DESIGN EXPLORING** ...philosophy/organization/procedure of the Mechanical Design Technology Program, brief overview of the engineering profession by involvement in a design project to illustrate basic concepts/methods of machine design. (Prerequisite: Accepted into the Mechanical Design Technology program)

**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. (Corequisite: 10-607-119, Civil Drafting Technology OR 10-606-119, Technical Sketching OR 10-614-113, 2D Essentials)

**10-606-122 CAD-FABRICATION & ASSEMBLY** ...sheet metal drawings as applied to brackets, enclosures & guarding; welding drawings; threads & fasteners; stock components; working drawing documentation. (Prerequisite: 10-606-113, CAD)

**10-606-126 GEOMETRIC DIMENSIONING/TOLERANCING** ...review of standard dimensioning, datums, material condition symbols, tolerances of form and profile, tolerances of orientation and run out, location tolerances and virtual condition. (Prerequisite: 10-606-113, CAD; OR 10-606-157, Solidworks Fund and Drawings OR 10-606-162, Solidworks Fundamentals)

**10-606-135 MACHINE MEMBERS-STRENGTH** ...force analysis, moments, truss and frame analysis, simple stress, properties of materials, joint design, centroids and moments of inertia, beam design, shafting design, combined stresses, columns. (Prerequisites: 10-806-154, General Physics 1; 10-804-196, Trigonometry w Apps.)

**10-606-139 CAD-ELECTRICAL CONTROL** ...draw block and flow diagrams, logic diagrams; introduction to programmable control; fundamentals of electronics; motors and control circuits; sheet metal chassis and panel drawings. (Prerequisite: 10-606-113, CAD)

**10-606-141 DESIGN PROBLEMS** ...data gathering, mathematics, document standard practices, project management and teamwork. (Prerequisites: 10-606-126, Geometric Dimensioning/Tol; 10-606-135, Machine Members-Strength; 10-606-103, 2D CAD Adv, 10-606-158, Solidworks Adv.)

**10-606-143 MECHANISMS** ...study of motion, vector equations and sense notation, basic motion concepts, kinematic drawing and displacement, velocities in mechanisms, accelerations in mechanisms, CAM motions, and gear trains. (Prerequisites: 10-806-154, General Physics 1; 10-606-113, CAD; 10-804-196, Trigonometry w Apps)

**10-606-157 SOLIDWORKS FUNDAMENTALS AND DRAWINGS** ...terminology, software operation and interface basics, creating basic models, creating casting and forging models, revolved features, Solidworks drawing environment and fully dimensioned orthographic drawings. (Corequisite: 10-606-119, Sketching-Technical, OR 10-614-113, 2D Essentials Sketching-Technical; Prerequisite: Familiarity with Windows file management.)

**10-606-158 SOLIDWORKS ADVANCED** ...sweeps, equations, configurations, draft, base and derived parts, assemblies, assembly drawings, auxiliary, section and special views, sheet metal, lofting, surfacing, and core and cavity. (Prerequisite: 10-606-157, Solidworks Fund and Drawings OR 10-606-163, Solidworks-Intermediate)

**10-606-159 MATERIALS SCIENCE** ...engineering materials, material selection, the relationship between material structure and properties, and failure analysis for design improvement. Materials covered include; metallic, polymeric, ceramic, and composite/exotic.

**10-614-113 2D ESSENTIALS** ...an introduction to technical communication, annotation, geometric construction, model, orthographic and pictorial, section and auxiliary views and dimensioning. Knowledge integral to Model Building.

**10-620-100 FLUIDS 1: BASIC PNEUMATICS** ...what fluid power is, differentiate between hydraulics and pneumatics, implement basic pneumatic circuits, utilize schematics, apply Pascal's law, define properties of fluids, implement airflow control and hydraulics cylinder circuits.

**10-620-101 FLUIDS 2: BASIC HYDRAULICS** ...hydraulic pumps, basic hydraulics actuator circuits, hydraulic schematics, apply Pascal's Law, summarize the effects of fluids friction, define properties of hydraulic energy, design hydraulic circuits with directional control valves. (Corequisite: 10-620-100, Fluids 1: Basic Pneumatics)

**10-620-165 FLUIDS 3: INTERMEDIATE HYDRAULICS** ...design of cylinder actuating circuits with pressure-compensated flow control valves, how to control pressure, pilot-operated check valve applications, accumulator operation and application, hydraulic motor types and applications. (Prerequisite: 10-620-101, Fluids 2: Basic Hydraulics)

# Medical Assistant

Program Code 315091

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Medical Assistant program prepares individuals to assist physicians in their offices or other medical settings. Medical assistants perform a wide range of duties. The medical assistant is responsible for medical and surgical asepsis, taking vital signs, assisting the physician with examinations and surgery, administering EKGs and administering medications. The business/administrative duties include patient reception, appointment making, record keeping, filing, bookkeeping, insurance handling, typing medical correspondence and transcription and microcomputer applications. Laboratory functions include specimen collection, performance of basic laboratory tests and microscopic work. Graduates find jobs as medical assistants, medical office assistants, medical laboratory assistants, phlebotomists, receptionists, medical insurance clerks and electrocardiogram technicians.

### Program Outcomes

- Perform clerical functions.
- Perform bookkeeping procedures.
- Prepare special accounting entries.
- Apply principles of medical asepsis.
- Perform specimen collection.
- Perform diagnostic testing.
- Process insurance claims.
- Provide patient care.
- Communicate effectively.
- Apply legal and ethical concepts.
- Instruct patients.
- Perform medical office operational functions.
- Demonstrate professionalism in a health care setting.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Accreditation

The Medical Assistant Program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), on recommendation of the Medical Assistant Education Review Board of the American Association of Medical Assistants' Endowment (AAMAE).

### Employment Potential

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

**Medical Assistant:** prepares a patient for examination or treatment, takes vital signs, performs simple lab tests, performs electrocardiograms, performs administrative functions, and assists the physician as needed within clinical procedures. *Upon successful completion of the certification exam, certified medical assistant status is obtained.*

**Medical Insurance Clerk:** processes insurance claims on a computer.

**EKG Technician:** operates and maintains electrocardiographic machines, records the heart's electrical activity, and provides data for diagnosis and treatment of heart ailments by physicians.

**Medical Laboratory Assistant:** performs simple laboratory procedures and venipunctures to collect blood specimens.

**Medical Records Clerk:** handles all patient medical records in areas such as progress notes and pulls records of patients on a daily basis.

**Medical Office Assistant:** performs a variety of duties related to bookkeeping, typing, filing, record keeping, customer relations, telephoning, general correspondence, appointments, and patient accounts.

**Phlebotomist:** obtains blood specimens by venipuncture and capillary puncture.

**Receptionist:** greets patients, schedules appointments, and answers telephone.

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

- Medical Laboratory Technician
- Medical Office Manager
- Medical Transcriptionist

### Clinical Experience

Students will have on-the-job experience in area clinics during a five-week medical affiliation during the second semester of the program. Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances, and participate in p.m. clinicals.

### Board/Certification Examinations

Graduates are eligible to take the national examination for Certified Medical Assistants.

Felons are not eligible for the AAMA Certification Examination unless the Certifying Board grants a waiver based on one or more of the mitigating circumstances listed in the Disciplinary Standards. CMAs who are currently employed or seeking employment may not use the CMA credential unless their CMA is current. However, Certified Medical Assistants who are temporarily or permanently retired may continue to use the CMA credential for ceremonial purposes only. (source: AAMA)

### Flexible Learning Option

A part-time on-line and weekend track is available. This option is scheduled over a four-semester period, including one summer. For details, please refer to the Part-time Medical Assistant brochure.

### Curriculum

The Medical Assistant Technical Diploma is a one year, two-semester, plus three-week program. Upon graduation, a student will have completed 33 credits.

#### First Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
* 10-501-104	Healthcare Customer Serv.	2
* 10-501-107	Intro to Healthcare Computing	2
* 31-509-301	Medical Asst Admin Procedures	1
* 31-509-302	Human Body in Health & Disease	3
* 31-509-303	Medical Asst Lab Procedures	1
* 31-509-304	Medical Asst Clin Procedures	4
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-809-199	Psychology Of Human Relations	3
* 31-501-308	Pharmacology for Allied Health	2
* 31-509-305	Med Asst Lab Procedures 2	2
* 31-509-306	Med Asst Clin Procedures 2	3
* 31-509-307	Med Office Insurance & Finance	2
* 31-509-309	Medical Law, Ethics & Profess	1
* 31-509-310	Medical Assistant Practicum	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>33</b>

\* No final grade lower than "C" is acceptable in any course marked with an asterisk. A student may repeat that particular course to achieve a "C" or better final grade in order to continue in or graduate from this program.

This program is fully eligible for financial aid.

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- Typing proficiency of 25-words per minute (mandatory preadmission typing test to be taken at NWTC Assessment Center).

### Requirements for Program Entry

- Meet established Academic Skill Assessment program benchmarks. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory orientation.
- Complete physical examination within three months before entering program or beginning medical affiliation and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course. Students are required to maintain a current CPR card to comply with affiliating agency requirements.
- Complete an American Heart Association Emergency First Aid course.



## **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](http://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.*

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**10-501-104 HEALTHCARE CUSTOMER SERVICE** ...is designed as an introduction to customer service for learners interested in working in various healthcare settings. The learner investigates healthcare systems, safety standards, and the workforce. The learner examines professionalism, interpersonal and written communication skills, and confidentiality as they relate to customer service in healthcare.

**10-501-107 INTRODUCTION TO HEALTHCARE COMPUTING** ...provides an introduction to basic computer functions and applications utilized in contemporary healthcare settings. Students are introduced to the hardware and software components of modern computer systems.

**31-501-308 PHARMACOLOGY FOR ALLIED HEALTH** ...introduces students to classifying medications into correct drug categories and applying basic pharmacology principles. Students apply basic pharmacodynamics to identifying common medications, medication preparation, and administration of medications used by the major body systems.

**31-509-301 MEDICAL ASSISTANT ADMINISTRATIVE PROCEDURES** ...introduces medical assistant students to office management and business administration by scheduling appointments, filing, record keeping, performing telephone and reception duties and communicating effectively with patients and other medical office staff. (Prerequisite: Accepted into Medical Assistant Program)

**31-509-302 HUMAN BODY IN HEALTH & DISEASE** ...students learn to recognize the causes, signs, and symptoms of diseases of the major body systems as well as the diagnostic procedures, usual treatment, prognosis and prevention of common diseases.

**31-509-303 MEDICAL ASSISTANT LABORATORY PROCEDURES 1**...introduces medical assistant students to routine laboratory procedures while following laboratory safety requirements and federal regulations testing. (Prerequisite: Accepted into Medical Assistant Program)

**31-509-304 MEDICAL ASSISTANT CLINICAL PROCEDURES 1** ...introduces students to the clinical procedures performed in the medical office setting. Students perform basic examining room skills including screening, vital signs, patient history, minor surgery and patient preparation for routine and specialty exams. (Prerequisite: Accepted into Medical Assistant Program)

**31-509-305 MEDICAL ASSISTANT LABORATORY PROCEDURES 2** ...prepares students to perform laboratory procedures commonly performed in the ambulatory care setting under the supervision of a physician. Students perform phlebotomy, immunology, hematology and chemistry laboratory procedures. (Prerequisite: 31-509-303, Medical Assist Lab Proc 1)

**31-509-306 MEDICAL ASSISTANT CLINICAL PROCEDURES 2** ...prepares students to perform patient care skills. Students perform clinical procedures including administering medications, assisting with minor surgery, performing an electrocardiogram, assisting with respiratory testing, and maintaining clinical equipment. (Prerequisite: 31-509-304, Medical Assistant Clinical Procedures 1)

**31-509-307 MEDICAL OFFICE INSURANCE & FINANCE** ...medical asepsis and infection control, vital signs, the patient examination, first aid, and basic life support. (Prerequisite: Accepted into Medical Assistant)

**31-509-309 MEDICAL LAW ETHICS & PROFESSIONALISM** ...prepares students to display professionalism and perform within ethical and legal boundaries in the health care setting. Students maintain confidentiality, examine legal aspects of the medical record, perform risk management procedures, and examine legal and bioethical issues.

**31-509-310 MEDICAL ASSISTANT PRACTICUM** ...requires students to integrate and apply knowledge and skills from all previous medical assistant courses in actual patient care settings. Learners perform medical assistant administrative, clinical, and laboratory duties under the supervision of trained mentors. (Prerequisite: Successful completion of all Medical Assistant courses)

# Network Specialist - IT

Program Code 101502

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Network Specialist - IT teaches students to design, install, configure, and maintain computer networks.

### Program Outcomes

- Design a local area network (LAN) per specifications.
- Construct a local area network using the required physical components.
- Install network hardware including modems, interface cards, and cabling.
- Create effective user environments using Microsoft and UNIX/LINUX operating systems.
- Install and configure network and desktop operating system software.
- Install and configure application software.
- Design, implement, and maintain a secure network environment.
- Exercise structured problem solving techniques.
- Use word processing, spreadsheet, database, and presentation software appropriately.
- Implement a web-based foundation for E-Business.
- Develop technical documentation for network configuration and security.
- Communicate technical information effectively.
- Assess the impact of emerging technologies.
- Maintain microcomputer hardware and peripherals.
- Implement and configure wide area network (WAN) services.
- Provide network user support.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- One year of high school algebra or equivalency.
- User level familiarity with one or more computer operating environments.
- Ability to interact with a computer system (keyboard or assist device).

### Employment Potential

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

**Network Support Specialist:** designs and configures networks, installs hardware and software components, and maintains network performance.

**Network Administrator:** develops security procedures, assigns access rights, installs application software, and configures user profiles.

*Successful completion of the course work in this program will also prepare a student to pursue vendor certification as a Network Engineer.*

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

- Cable Installer
- UNIX Administrator
- PC Support Specialist
- Help Desk Technician
- IS Certifications, such as CNE, MSCE, A+, Network+, and CCNA
- Web Developer
- Network Analyst

### Note

Critical skills required to be successful in each core program course are listed on the program website. Learners should review this information carefully before enrolling in a course.

### Curriculum

The Network Specialist - IT Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-141	Micro: Access-Intro	1
10-106-145	Keyboarding	1
10-150-163	IT:Network:Cisco 1	3
10-150-174	IT:Network:Client Op Sys	3
10-154-150	IT:Support:Hardware-Intro	3
10-801-195	Written Communication	3
10-804-133	Math & Logic	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-107-194	IT:Documentation	2
10-150-157	IT:Network:UNIX/LINUX-Intro	3
10-150-165	IT:Network:Microsoft Server 1	3
10-150-168	IT:Network:Cisco 2	3
10-801-196	Oral/Interpersonal Comm	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-150-145	IT:Network:Security Fund	3
10-150-186	IT:Network:Microsoft Server 2	4
10-150-188	IT:Network:Applications	4
10-809-172	Race Ethnic & Diversity	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-150-170	IT:Network:Capstone	2
10-150-172	IT:Network:Cisco 3	2
10-150-196	IT:Network:Admin-Adv	4
10-150-198	IT:Network:Internship	3
10-809-166	Intro to Ethics: Theory & App	3
	Elective	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>68</b>

#### Suggested Electives:

IT:Project/Chg Mg 1-MS Project, 10-107-151  
IT:Network:Firewall Inst/Conf, 10-150-146  
IT:Network:UNIX-Intermediate, 10-150-155  
IT:Network:Computer Forensics, 10-150-169  
IT:Program:Visual Basic, 10-152-163  
IT:Support:Hardware-Advanced, 10-154-158

This program is fully eligible for financial aid.

## Please Note

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- 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.*

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-106-145 KEYBOARDING** ...keyboarding at a personal productivity level, correct posture, touch typing on the alpha-numeric keyboard using an interactive software package running on a microcomputer. No experience required.

**10-107-194 IT:DOCUMENTATION** ...students plan documentation content and delivery methods; develop online, context sensitive, and written documentation, become familiar with ISO 9000 standards, package PDF files, and create compiled help modules. (Prerequisite: 10-801-195, Communication-Written or equivalent)

**10-150-145 IT:NETWORK:SECURITY FUNDAMENTALS** ...examine common security vulnerabilities and defenses used to protect network resources. Included is a discussion of security policies, user awareness training, network monitoring, and secure network design.

**10-150-157 IT:NETWORK:UNIX/LINUX-INTRO** ...an introductory look at Unix/Linux administration and implementation. The learner will install, configure, and administer a Unix/Linux server, populate the system with users/groups, write scripts, and troubleshoot system failures.

**10-150-163 IT:NETWORK:CISCO 1** ...cable characteristics and termination, structured cabling systems, OSI reference model, IP addressing and subnetting, network architectures and basic protocols, Ethernet switches, basic router operation and configuration.

**10-150-165 IT:NETWORK:MICROSOFT SERVER 1** ...Microsoft Server OS administration and implementation. Learner will install and configure the OS, Active Directory, Group Policies, IIS and security. Exam objectives for the Microsoft's 70-290 exam are addressed.

**10-150-168 IT:NETWORK:CISCO 2** ...configuring routing protocols, access control lists, broadcast and collision domains, serial protocols, WAN services, protocol analysis, cellular communications, and Internet access alternatives.

**10-150-170 IT:NETWORK:CAPSTONE** ...individual case studies to review and consolidate the knowledge and skills gained in previous classes. Course is intended to be taken during the student's last semester. (Prerequisite: 10-150-157, IT:Network:UNIX/LINUX-Intro; 10-150-168, IT:Network:Cisco 2; 10-150-186, IT:Network:Microsoft Server 2; 10-150-188, IT:Network:Applications)

**10-150-172 IT:NETWORK:CISCO 3** ...layer 2 & 3 switching, switch configuration, management and security, configure and manage VLANs, trunking, inter-VLAN routing, access control lists and other advanced Cisco topics.

**10-150-174 IT:NETWORK:CLIENT OPERATING SYSTEMS** ...basic OS functions; memory, CPU, device/file management techniques, OS installation/configuration; configuration of I/O and storage devices; basic network connectivity; standard system maintenance procedures; command line introduction and batch file writing.

**10-150-186 IT:NETWORK:MICROSOFT SERVER 2** ...remote workstation installation and administration, DHCP, DNS, IPsec, and VPN. Enterprise software deployment, Terminal Services, multi domain management and migration. Administration scripting, performance monitoring, and network security.

## 10-150-188 IT:NETWORK:APPLICATIONS

...fundamentals of project management, software installation in a network environment, application launching options, application and data security, Groupware applications, Network utility software, and effective user support.

**10-150-196 IT:NETWORK:ADMINISTRATION-ADVANCED** ...intranet Web site planning, implementation of Web pages using a variety of development tools, introduction to the principles of electronic commerce.

**10-150-198 IT:NETWORK:INTERNSHIP** ...individual on-the-job training: consulting with users in design, development, testing, debugging, and documentation problems; training in uses of network facilities; and/or configuring and installing network hardware and software. Course should be taken during the last semester.

## 10-154-150 IT:SUPPORT:HARDWARE-INTRO

...computer/network terminology, component identification, POST, computer/peripheral/printer maintenance, system boards, memory systems, FAT vs. NTFS, operating system/network installations/configurations, internet research, troubleshooting, command line.

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## Note

Critical skills required to be successful in each core program course are listed on the program website. Learners should review this information carefully before enrolling in a course.



# Nursing Assistant

Program Code 305431

## Technical Diploma

Offered throughout the District. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Nursing Assistants assist in providing care of sick or injured patients under the supervision of the nursing and/or medical staff.

### Program Outcomes

- Apply for competency testing to be placed on the Wisconsin Nurse Aide Registry.
- Obtain employment as a Nursing Assistant.
- Display behavior which supports and promotes residents' rights.
- Perform basic nursing/personal care skills.
- Assist residents in attaining and maintaining independence.
- Interact effectively with residents experiencing dementias.
- Interact on a one-to-one-basis with residents, with sensitivity to their emotional, social, and mental health.

### Requirements for Program Entry

- NWTC requires an entrance skill inventory for all program students.
- Requirements for program entry must be completed prior to the start of program.
- Students must take an Academic Skills Assessment or ACT exam (must be within three years, unless you have a two or four year degree) and attain program benchmarks (see the Academic Skills Assessment section of this catalog for more information) before admission to the program. Academic Skills Assessment benchmarks must be met prior to submitting application or remediation must be submitted with application.
- Please see the Academic Skills Assessment section of this catalog for more information on required reading skill inventory.
- Be at least 16 years old.
- Have a medical examination satisfactorily completed within one year before entering program.
- Provide documentation of immunization history.
- Access to high speed Internet and a DVD player is helpful.
- Push, pull, lift, and/or support up to 50 pounds of weight.

### Employment Potential

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

**Nursing Assistant:** performs basic nursing tasks under the supervision and direction of the Registered Nurse in a nursing home, home health environment, or hospital setting.

### Note

- All textbook, workbook and Blackboard™ assignments must be completed before attending clinical.
- This course is completed within six to eight weeks and will meet at least one to two days a week.
- Classroom and clinical attendance is mandatory. Any missed clinical hours must be made up.
- Individuals with abuse records may not be eligible for employment.

### Clinical Experience

Students will be required to purchase a nametag and uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances to meet clinical requirements.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Curriculum

The Nursing Assistant Technical Diploma is a 120-hour program which includes skill pre-work, lecture, lab and clinical. Upon graduation, a student will have completed three credits. Orientation will be done during the first class.

### First Semester

Catalog No.	Description	Credits
30-543-300	Nursing Assistant	3
<b>Semester Total</b>		<b>3</b>
<b>Total Credits</b>		<b>3</b>

This program is *not* eligible for financial aid.

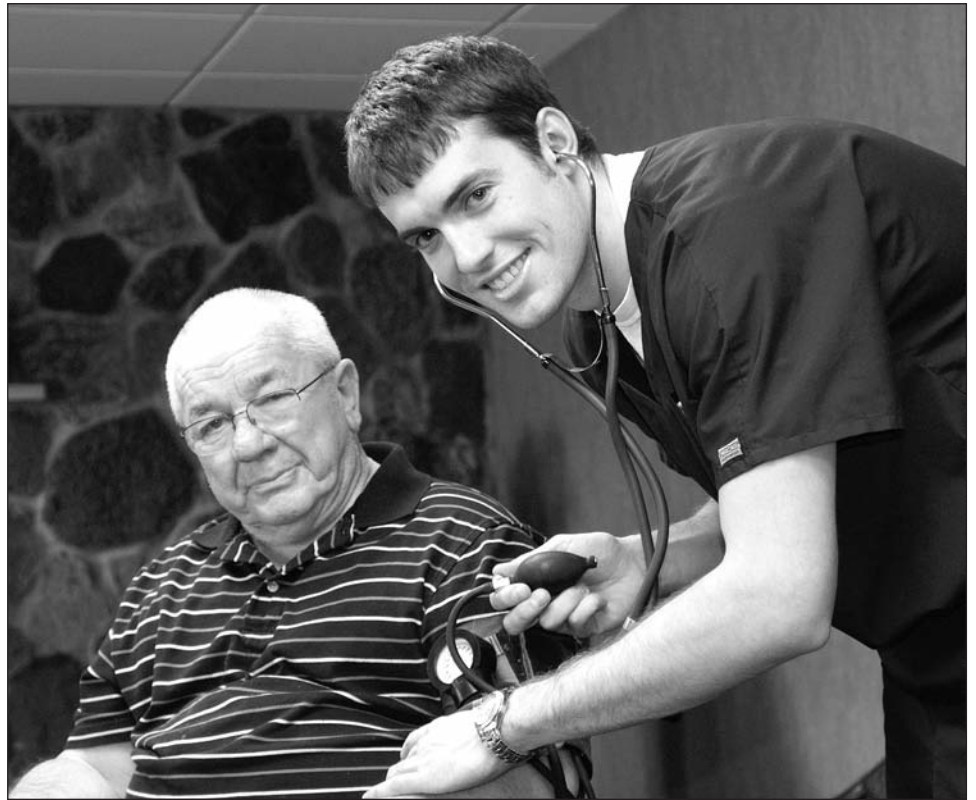
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- Descriptions of courses not found on this page can be found in the back of this catalog.

**Course Description**

*This course provides an opportunity for students to develop the knowledge, skills, and understanding required for employment in this field.*

**30-543-300 NURSING ASSISTANT** ...basic nursing/personal care skills, principles of communication skills, resident rights and team work with other care givers under the supervision of a licensed nurse.



# Nursing-Associate Degree

Program Code 105431

## Associate Degree

Offered at the Green Bay, Marinette and Sturgeon Bay campuses. The first year of the program is also offered at the West Regional Learning Center-Shawano. For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. For information in Shawano: (715) 524-2418. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Graduates plan, provide, and evaluate patient care. They act as liaisons between physicians, other health care workers, and the patient. They supervise other health care providers.

### Program Outcomes

- Adhere to professional standards of practice within legal, ethical, and regulatory frameworks of the registered nurse.
- Use effective communication skills incorporating lifespan considerations.
- Assess health of individuals, families, and groups across the lifespan within the context of the community.
- Make clinical decisions to ensure assure safe and accurate nursing care.
- Provide safe caring interventions with diverse populations across the lifespan.
- Collaborate with others to respond to the needs of individuals, families, and groups across the health-illness continuum.
- Manage care to facilitate continuity within and across health care settings.
- Use teaching and learning processes to promote and restore health incorporating lifespan considerations.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances, and participate in p.m. clinicals.

### Accreditation

The Nursing-Associate Degree program is accredited by: National League for Nursing Accrediting Commission (NLNAC)  
3343 Peachtree Road, NE, Suite 500  
Atlanta, GA 30326  
(212) 363-5555 FAX: (212) 812-0391

### The Nursing Associate Degree program is approved by:

Wisconsin Board of Nursing  
Dept. of Regulation & Licensing  
1400 East Washington St.  
P.O. Box 8935, Madison, WI 53708-8935  
(608) 266-2112

### Employment Potential

A graduate of this program who becomes a Registered Nurse in a variety of health care settings will have the potential for employment in the following areas:

**Staff Nurse:** is responsible for making nursing diagnoses and treating human responses to actual and potential health problems in health care facilities and insurance areas.

**Charge Nurse:** assumes the same responsibilities of a Registered Nurse in addition to directing the work flow and coordinating and managing the provision of care of patients and other staff in a medical facility.

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years. Academic Skills Assessment program benchmarks, or minimum standard composite score of 22 on the ACT (minimum of math 18, reading 21, sentence skills 21), must be met prior to submitting an application. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- One year of Biology and Chemistry, passed with a "C" grade or better. If in high school, "C" in two semesters of each.
- All students must successfully complete a DHFS approved Nursing Assistant course prior to submitting an application to the program.

### Priority Admission Statement

Applicants with documentation of completion of General Anatomy and Physiology OR Introduction to Biochemistry with a "B" or better, will receive priority standing for Fall 2009 application window. Effective January 2010 Introduction to Biochemistry with a "B" or better will be the only class accepted for priority admission.

### Requirements for Program Entry

- Attend mandatory orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course. Students are required to maintain a current CPR card to comply with affiliating agency requirements.

### Board/Certification Examinations

Graduates are eligible to take the NCLEX-RN Examination for licensure as a Registered Nurse (RN).

After completion of second semester, students are eligible to take the NCLEX-PN for licensure as a Practical Nurse.

### Flexible Learning Options

A part-time evening/weekend track is available. This option is scheduled over a ten-semester, four-year period, including three summers. For details, please refer to the Part-time Nursing-Associate Degree brochure.

This program is fully eligible for financial aid.

### Curriculum

The Nursing-Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 70 credits.

#### Pre-Semester

Catalog No.	Description	Credits
* 10-806-186	Intro to Biochemistry	3
<b>Semester Total</b>		<b>3</b>

#### First Semester

* 10-543-101	Nursing Fundamentals	2
* 10-543-102	Nursing Skills	3
* 10-543-103	Nursing Pharmacology	2
* 10-543-104	Nsg: Intro Clinical Practice	2
10-801-195	Written Communication	3
++ 10-806-177	Gen Anatomy & Physiology	4
10-809-188	Developmental Psychology	3
<b>Semester Total</b>		<b>19</b>

#### Second Semester

* 10-543-105	Nursing Health Alterations	3
* 10-543-106	Nursing Health Promotion	3
* 10-543-107	Nsg: Clin Care Across Lifespan	2
* 10-543-108	Nsg: Intro Clinical Care Mgt	2
10-801-196	Oral/Interpersonal Comm	3
++ 10-806-179	Adv Anatomy & Physiology	4
<b>Semester Total</b>		<b>17</b>

#### Third Semester

* 10-543-109	Nsg: Complex Health Alterat 1	3
* 10-543-110	Nsg: Mental Health Comm Con	2
* 10-543-111	Nsg: Intermed Clin Practice	3
* 10-543-112	Nursing Advanced Skills	1
* 10-806-197	Microbiology	4
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

* 10-543-113	Nsg: Complex Health Alterat 2	3
* 10-543-114	Nsg: Mgt & Profess Concepts	2
** 10-543-115	Nsg: Adv Clinical Practice	3
* 10-543-116	Nursing Clinical Transition	2
10-809-196	Intro to Sociology	3
<b>Elective</b>		<b>2</b>
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>70</b>

\*No final grade lower than a "C" is acceptable in the nursing or natural science courses marked with an asterisk. A student must repeat the particular course with "C" or better final grade to continue in or graduate from this program. If the course is sequential, the successful retake must occur before continuing the sequence.

++No final grade lower than a "B" is acceptable in General or Advanced Anatomy & Physiology. A student must repeat the particular course with a "B" or better final grade to continue in the program. If the course is sequential, the successful retake must occur before continuing the sequence.

\*\* Must complete 10-543-115, Advanced Clinical Practice, with a "C" or better prior to the start of 10-543-116, Clinical Transition

### Note

- Graduates are eligible to apply for direct transfer of credit in the nursing programs at the University of Wisconsin and private colleges and universities.
- Individuals with criminal records may be ineligible for licensure. Individuals with abuse records may be ineligible for employment in nursing homes.
- Licensed Practical Nurses may receive advanced standing for nursing courses in the first year of the program. Introduction to AD Nursing (10-543-120) must be taken concurrent with second-year nursing courses. Call (920) 498-5430 for information.



## Please Note

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- 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.*

**10-543-101 NURSING FUNDAMENTALS** ...focuses on basic nursing concepts that the beginning nurse will need to provide care to diverse patient populations across the lifespan. Current and historical issues impacting nursing will be explored within the scope of nursing practice. The nursing process will be introduced as a framework for organizing the care of patients with alterations in cognition, elimination, comfort, grief/loss, mobility, integument, and fluid/electrolyte balance. (Prerequisite: Accepted into Nursing-AD Program; Corequisite: 10-806-177, Gen Anatomy & Physiology)

**10-543-102 NURSING SKILLS** ...focuses on development of clinical skills and physical assessment across the lifespan. Content includes mathematic calculations and conversions related to clinical skills, blood pressure assessment, aseptic technique, wound care, oxygen administration, tracheostomy care, suctioning, management of enteral tubes, basic medication administration, glucose testing, enemas, ostomy care, and catheterization. In addition the course includes techniques related to obtaining a health history and basic physical assessment skills using a body systems approach. (Prerequisite: Accepted into Nursing-AD Program; Corequisites: 10-806-177, Gen Anatomy & Physiology; 10-543-101, Nursing Fundamentals; 10-543-103, Nursing Pharmacology; 10-543-104, Nursing Intro to Clin Practice)

**10-543-103 NURSING PHARMACOLOGY** ...this course introduces the principles of pharmacology, including drug classifications and their effects on the body. Emphasis is on the use of the components of the nursing process when administering medications. (Prerequisite: Accepted into Nursing-AD Program; Corequisite: 10-806-177, Gen Anatomy & Physiology)

**10-543-104 NURSING: INTRO TO CLINICAL PRACTICE** ...basic nursing skills, the formation of nurse-client relationships, communication, data collection, documentation, and medication administration. (Prerequisite: Accepted into Nursing-AD Program; Corequisites: 10-806-177, Gen Anatomy & Physiology; 10-543-101, Nursing Fundamentals; 10-543-102, Nursing Skills; 10-543-103, Nursing Pharmacology)

**10-543-105 NURSING HEALTH ALTERATIONS** ...this course elaborates upon the basic concepts of health and illness as presented in Nursing Fundamentals. It applies theories of nursing in the care of the clients through the lifespan, utilizing problem solving and critical thinking. This course will provide an opportunity to study conditions affecting different body systems and apply therapeutic nursing interventions. It will also introduce concepts of leadership, team building, and scope of practice. (Prerequisite: Completion of 1st semester coursework; Corequisites: 10-543-108, Nursing: Intro to Clin Manag; 10-806-179, Advanced Anatomy & Physiology)

**10-543-106 NURSING HEALTH PROMOTION** ...this course focuses on topics related to health promotion for individuals and families throughout the lifespan. We will cover nursing care of the developing family, which includes reproductive issues, pregnancy, labor and delivery, post-partum, the newborn, and the child.

Recognizing the spectrum of healthy families we will discern patterns associated with adaptive and maladaptive behaviors applying mental health principles. An emphasis is placed on teaching and supporting healthy lifestyles choices for individuals of all ages. Nutrition, exercise, stress management, empowerment, and risk reduction practices are highlighted. Study of the family will cover dynamics, functions, discipline styles, and stages of development. (Prerequisite: Completion of 1st semester coursework; Corequisite: 10-543-107, Nursing: Clin Care Life Span; 10-806-179, Advanced Anatomy & Physiology)

**10-543-107 NURSING CLINICAL CARE ACROSS LIFESPAN** ...this clinical experience applies nursing concepts and therapeutic interventions to clients across the lifespan. It also provides an introduction to concepts of teaching and learning. Extending care to include the family is emphasized. (Prerequisite: Completion of 1st semester coursework; Corequisites: 10-543-106, Nursing Health Promotion; 10-806-179, Advanced Anatomy & Physiology)

**10-543-108 NURSING: INTRO TO CLINICAL CARE MANAGEMENT** ...this clinical experience applies nursing concepts and therapeutic nursing interventions to groups of clients across the lifespan. It also provides an introduction to leadership, management, and team building. (Prerequisite: Completion of 1st semester coursework; Corequisites: 10-543-105, Nursing Health Alterations; 10-806-179, Advanced Anatomy & Physiology)

**10-543-109 NSG: COMPLEX HEALTH ALTERATIONS 1** ...prepares the learner to expand knowledge from previous courses in caring for clients across the lifespan with alterations in cardiovascular, respiratory, endocrine, and hematologic systems as well as clients with fluid/electrolyte and acid-base imbalance, and alterations in comfort. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-543-110, Nsg: Mental Health; 10-543-111, Nsg: Intermediate Clin Practice; 10-543-112, Nsg: Advanced Skills; 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-110 NURSING: MENTAL HEALTH COMMUNITY CONCEPTS** ...this course will cover topics related to the delivery of community and mental health care. Specific health needs of individuals, families, and groups will be addressed across the lifespan. Attention will be given to diverse and at-risk populations. Mental health concepts will concentrate on adaptive/maladaptive behaviors and specific mental health disorders. Community resources will be examined in relation to specific types of support offered to racial, ethnic, economically diverse individuals and groups. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-543-109, Nsg: Comp Health Alt 1; 10-543-111, Nsg: Intermediate Clin Practice; 10-543-112, Nsg: Advanced Skills; 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-111 NURSING: INTERMEDIATE CLINICAL PRACTICE** ...this intermediate level clinical course develops the RN role when working with clients with complex health care needs. A focus of the course is developing skills needed for managing multiple clients and priorities across the lifespan. Using the nursing process students will gain experience in adapting nursing practice to meet the needs of clients with

diverse needs and backgrounds. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-543-109, Nsg: Comp Health Alt 1; 10-543-110, Nsg: Mental Hlth Concepts; 10-543-112, Nsg: Advanced Skills; 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-112 NURSING ADVANCED SKILLS** ...this course focuses on the development of advanced clinical skills across the lifespan. Content includes advanced IV skills, blood product administration, chest tube systems, basic EKG interpretation and nasogastric/feeding tube insertion. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-543-109, Nsg: Comp Health Alt 1; 10-543-110, Nsg: Mental Hlth Concepts; 10-543-111, Nsg: Intermediate Clin Practice; 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-113 NURSING: COMPLEX HEALTH ALTERATIONS 2** ...prepares the learner to expand knowledge and skills from previous courses in caring for clients across the lifespan with alterations in the immune, neurosensory, musculoskeletal, gastrointestinal, hepatobiliary, renal/urinary and the reproductive systems. The learner will also focus on management of care for clients with high-risk perinatal conditions, high-risk newborns and the ill child. Synthesis and application of previously learned concepts will be evident in the management of clients with critical/life threatening situations. (Prerequisite: Completion of 3rd semester coursework; Corequisites: 10-543-114, Nsg: Mgt & Profess Concepts; 10-543-115, Nursing Advanced Clinical Practice; 10-543-116 Nursing Clinical Transition)

**10-543-114 NURSING: MANAGEMENT/PROFESSIONAL CONCEPTS** ...this course covers nursing management and professional issues related to the role of the RN. Emphasis is placed on preparing for the RN practice. (Prerequisite: Completion of 3rd semester coursework; Corequisites: 10-543-113, Nsg Complex Health Alterat 2; 10-543-115, Nursing Advanced Clinical Practice; 10-543-116, Nursing Clinical Transition)

**10-543-115 NURSING: ADVANCED CLINICAL PRACTICE** ...this advanced clinical course requires the student to integrate concepts from all previous courses in the management of groups of clients facing complex health alterations. Students will have the opportunity to further develop critical thinking skills using the nursing process in making clinical decisions. Continuity of care through interdisciplinary collaboration is emphasized. (Prerequisite: Completion of 3rd semester coursework; Corequisites: 10-543-113, Nsg: Complex Health Alterat 2; 10-543-114, Nsg: Mgt & Profess Concepts)

**10-543-116 NURSING CLINICAL TRANSITION** ...this clinical experience integrates all knowledge learned in the previous courses in transitioning to the role of the graduate nurse. The course promotes relatively independent clinical decisions, delegation, and works collaboratively with others to achieve client and organizational outcomes. Continued professional development is fostered. (Prerequisite: Completion of 3rd semester coursework; Corequisites: 10-543-115, Nsg: Adv Clinical Practice; 10-543-113, Nsg: Complex Health Alterat 2; 10-543-114, Nursing Management Concepts)

# Office Assistant

Program Code 311061

## Technical Diploma

Offered at the Green Bay, Marinette and Sturgeon Bay campuses. For information in Green Bay: (920) 498-5444.

For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Office Assistant prepares students for office positions. Skills are developed in word processing, spreadsheet, presentation graphics, machine transcription, telephone, records management, office procedures, and keyboarding. Credits earned in the program can be applied toward the Software Level 1 and/or Software Level 2 certificates and the Administrative Assistant Associate Degree program.

### Program Outcomes

- Keyboard efficiently using correct techniques.
- Communicate business messages effectively.
- Produce effective business documents.
- Apply organizational skills to prioritize and manage workflow.
- Use appropriate technology to perform office tasks and manage information.
- Present researched information.
- Integrate appropriate software to produce business documents.
- Demonstrate professionalism in the business environment.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Basic math.
- A keyboarding skill of 20 words per minute using the TOUCH method is recommended.

### Employment Potential

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

**Office Assistant:** performs a variety of duties related to keyboarding, filing, transcribing, word processing, telephoning, making appointments, recordkeeping, setting up meetings, handling customer relations, entering data, and handling incoming and outgoing mail.

**Records Coordinator:** works in offices with a great volume of records in which indexing, cross-referencing, filing, retrieving, and charging-out records are important job functions.

**Front Desk Coordinator:** manages the company's lobby area; greets and directs all visitors, including vendors, clients, job candidates and customers; ensures completion of paperwork, sign-in and security procedures; handles special administrative projects, as well as overflow work from department and executive assistants; depending on the size of the firm, also may answer incoming calls.

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

- Administrative Assistant
- Executive Assistant
- Team Leader
- Office Manager

### Portfolio

Students are required to complete a program portfolio prior to graduation.

### Curriculum

The Office Assistant Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 35 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-111	Micro: Windows-Intro	1
10-103-121	Micro: Word-Intro	1
10-103-122	Micro: Word-Part 2	1
10-103-151	Micro: PowerPoint-Intro	1
10-106-103	Info Process Principles	3
10-106-107	Keyboard-Speed Building 1	1
10-106-112	Keyboard-Speed Building 2	1
10-106-131	Proofreading/Editing Essen 1	3
10-106-153	Professional Profile	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-103-131	Micro: Excel-Intro	1
10-103-132	Micro: Excel-Part 2	1
10-103-160	Micro: Outlook	1
10-106-126	Admin Business Procedures 1	2
10-106-132	Proofreading/Editing Essen 2	2
10-106-142	Software Projects	3
10-106-143	Business Experience-Applied	1
10-106-152	Records Management	2
10-106-172	Telephone/Messaging Skills	1
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>35</b>

This program is fully eligible for financial aid.

## 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](http://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.*

### 10-103-111 MICRO: WINDOWS-INTRODUCTION

...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-122 MICRO: WORD-PART 2** ...advanced word processing features including working with headers/footers, inserting quick parts, themes, styles, sort and select; text flow; footnotes/endnotes, images, shapes, shared documents; specialized tables and indexes; forms; and sharing data. Requires strong introductory Word skills or Word-Intro.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-132 MICRO: EXCEL-PART 2** ... advanced formatting techniques and functions, working with templates, collaborating with multiple Excel users, Excel's database features and analysis tools. Requires prior completion of Excel Intro.

### 10-103-151 MICRO: POWERPOINT-INTRODUCTION

...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-103-160 MICRO: OUTLOOK** ...use email, distribution lists, signatures, attachments, and task lists; schedule appointments and meetings using the calendar; flag, filter, sort, and merge contacts, use message delivery options; archive messages and folders.

### 10-106-103 INFORMATION PROCESSING PRINCIPLES

...information processing cycle and workflow, terminology, hardware, software, networks, digital media, ergonomics, security, systems, Internet, and career opportunities.

**10-106-107 KEYBOARD-SPEED BUILDING 1** ...skill development on the alphabetic keyboard using analytic/diagnostic software. Minimum alphabetic speed developed is 40 wpm in a 3-minute timing. Requires touch keyboarding at 30 wpm.

**10-106-112 KEYBOARD-SPEED BUILDING 2** ...skill development on the alphabetic keyboard, top-row number keys, and ten-key pad using analytic/diagnostic software. Minimum alphabetic speed developed is 45 wpm in a 5-minute timing. Requires touch keyboarding at 40 wpm.

**10-106-126 ADMINISTRATIVE BUSINESS PROCEDURES 1** ...today's global business environment including time management using software tools, flexible work arrangements, processing mail, meeting coordination, copiers and fax machines, and application of common business communication using appropriate formats. Requires Windows, intermediate Word, PowerPoint, and Outlook experience. (Prerequisite: 10-106-131, Proofreading/Editing Essentials 1; Corequisite: 10-106-142, Software Projects )

**10-106-131 PROOFREADING/EDITING ESSENTIALS 1** ...develop skills for using, identifying, and correcting grammar, spelling, punctuation, capitalization, number usage and abbreviations for creating error-free business documents. Introduction and use of reference manuals/resources and portfolio guidelines. (Touch keyboarding and basic word processing skills are assumed.)

**10-106-132 PROOFREADING/EDITING ESSENTIALS 2** ...apply advanced proofreading and editing skills in electronic and printed business documents using Proofamatics technique, transcription equipment, reference manuals, and resources. Multitasking and decision-making skills are enhanced through transcription and proofreading. (A passing grade in Proofreading/Editing Essentials 1 is a strong recommendation for success.)

**10-106-142 SOFTWARE PROJECTS** ...applying Windows and Word features to manage and format business documents while exercising decision-making, increasing efficiency, and enhancing keyboarding skills. Requires Windows, intermediate Word background, and 40 wpm keyboarding skill.

**10-106-143 BUSINESS EXPERIENCE-APPLIED** ...completing a portfolio, studying job search skills, and participating in a field experience. Course should be taken during the last semester.

**10-106-152 RECORDS MANAGEMENT** ...major systems of filing classification: alphabetic, numeric, geographic and subject; retention and disposition of records; records equipment and technology.

**10-106-153 PROFESSIONAL PROFILE** ...developing a professional image and attitude, including study of business ethics and etiquette; goal setting; anger, stress, and time management; understanding of diverse cultures; and development of platform skills.

**10-106-172 TELEPHONE/MESSAGING SKILLS** ...using the telephone effectively and efficiently in the world of work; telephone etiquette, messaging, and voice mail.



# Paralegal

Program Code 101101

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

A Legal Assistant or Paralegal is a person qualified by education, training, or work experience who is employed or retained by a lawyer, law office, corporation, governmental agency, or other entity who performs specifically designated substantive legal work for which a lawyer is responsible. Paralegals are not authorized to practice law. Remediation will be strongly recommended for those students not meeting the program benchmarks.

### Program Outcomes

- Describe law office systems and organization.
- Describe state and federal court systems.
- Identify roles and responsibilities of lawyers and paralegals.
- Compare civil, criminal, and administrative procedures.
- Use legal terminology.
- Conduct client interviews.
- Conduct investigations.
- Organize facts and evidence.
- Prepare legal documents.
- Conduct legal and factual research.
- Use correct citation form.
- Comply with rules regarding unauthorized practice of law and professional responsibility.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Ability to use Windows and Microsoft Word proficiently.
- Successful completion of reading and language assessment prior to admission.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Credentials

The Paralegal Program is approved by the American Bar Association (ABA) and is also a member of the American Association for Paralegal Education.

American Bar Association  
541 North Fairbanks Ct.  
Chicago, IL 60611  
Phone: (312) 988-5617

### Employment Potential

A graduate of this program will have the potential for employment as a Paralegal or Legal Assistant. Paralegals are not authorized to practice law. Paralegals perform work under the supervision of a lawyer in a variety of settings. A graduate may be employed by a private law firm; insurance company, corporation, bank, private business; legal clinic; agency of the federal, state, or local government; legal service or legal aid office; law departments; special interest group or association; criminal law office; service company or consulting firm.

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

- Law Office Administrator
- Law Office Manager
- Paralegal Supervisor
- Paralegal Instructor
- Corporate Compliance Officer
- Regulatory Specialist
- Research Analyst

### A Special Note to Learners Holding a Bachelor's Degree

Learners holding a bachelor's degree from an accredited institution have the option of pursuing a Post-Baccalaureate Certificate for Paralegal. For more information, contact Donna Meves at (920) 498-6872.

### A Special Note to Those Learners Taking Online Courses

The ABA requires each learner to take a minimum of four legal specialty courses in a live, synchronous "real time" format.

\* NWTC requires you to take Civil Litigation 1 (10-110-102) and Civil Litigation 2 (10-110-103), and two other legal specialty courses of your choice, from NWTC in a live, synchronous, "real time" format. NWTC has designated the following courses as legal specialty courses:

### Required Legal Specialty Courses

- \* 10-110-102 Civil Litigation 1
- \* 10-110-103 Civil Litigation 2
- 10-110-104 Legal Research
- 10-110-105 Legal Writing
- 10-110-107 Legal Aspects/Business Org.

### Curriculum

The Paralegal Associate Degree is offered in the day and in the evening. It is a two-year, four-semester program. The program offers both full- and part-time completion options. Upon graduation, a student will have completed 66 credits.

#### First Semester

Catalog No.	Description	Credits
+ 10-110-101	Paralegal Intro/Legal Ethics	3
10-801-136	English Composition 1	3
10-801-196	Oral/Interpersonal Comm	3
10-804-106	Intro to College Math	3
10-809-103	Think Critically & Creatively	3
<b>Semester Total</b>		<b>15</b>

#### Second Semester

10-101-106	Accounting-for Non-Accountants	3
* 10-110-102	Civil Litigation 1	3
10-110-104	Legal Research	3
10-110-110	Real Estate Law	3
	(or ** choice below)	
10-110-175	Legal Computer Applications	3
<b>Semester Total</b>		<b>15</b>

#### Third Semester

* 10-110-103	Civil Litigation 2	3
10-110-106	Law-Family	3
	(or ** choice below)	
10-110-107	Legal Aspects/Business Org	3
10-110-114	Administration of Estates	3
	(or ** choice below)	
10-809-199	Psychology Of Human Relations	3
OR		
10-809-198	Intro to Psychology	3
	Elective	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-110-105	Legal Writing	3
10-110-142	Paralegal Internship	3
OR		
10-110-143	Paralegal Field Study	3
10-110-160	Law-Employment	3
	(or ** choice below)	
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
<b>Semester Total</b>		<b>18</b>
<b>Total Credits</b>		<b>66</b>

+ A grade of "C" or better must be achieved in 10-110-101 Paralegal Intro/Legal Ethics in order to proceed with core Paralegal courses (those numbered 10-110-XXX).

\*\* Legal specialty courses must take 4 of 8 courses below:

- 10-110-106 Family Law
- 10-110-110 Real Estate Law
- 10-110-114 Administration of Estates
- 10-110-115 Administrative Law
- 10-110-122 Creditor/Debtor Relations
- 10-110-160 Employment Law
- 10-110-168 Paralegal Criminal Procedures
- 10-110-169 Indian Law

This program is fully eligible for financial aid.

## 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](http://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.*

### 10-101-106 ACCOUNTING: INTRO FOR NON-

**ACCOUNTANTS** ...Teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

### 10-110-101 PARALEGAL INTRO/LEGAL ETHICS

...introduction to the legal profession: ethics, court system, legal research, and roles of the paralegal.

**10-110-102 CIVIL LITIGATION 1** ...civil procedure in state and federal courts, the litigation process with emphasis on the paralegal function in investigating and gathering information, and preparing pleadings and motions. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-103 CIVIL LITIGATION 2** ...civil litigation including discovery, settlement, trial, and appellate procedure. (Prerequisites: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better; 10-110-102, Civil Litigation 1)

**10-110-104 LEGAL RESEARCH** ...research terminology; sources of law; primary/secondary authority; mandatory/persuasive authority; citation form; factual/legal issues; effective research strategies; validating and updating results; computer-assisted legal research; Internet research. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-105 LEGAL WRITING** ...Process writing; writing fundamentals; proofreading; in-house documents; legal correspondence; analytical writing; synthesizing cases/authorities; briefing cases; legal memoranda; persuasive writing; drafting pleadings, motions, legal briefs; drafting discovery documents. (Prerequisites: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better; 10-110-104, Legal Research)

**10-110-106 LAW-FAMILY** ...this course is designed to familiarize the student with basic legal concepts involved in the area of family relations. The primary emphasis will be in the field of divorce. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

### 10-110-107 LEGAL ASPECTS/BUSINESS ORGANIZATIONS

...formation, operation, and dissolution of types of business organizations, and substantive and procedural law involving business organizations. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-110 REAL ESTATE LAW** ...law of real property, forms of ownership, land description methods, public and private encumbrances, real estate contracts, deeds, financing sources, title evidence, and the closing process. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-114 ADMINISTRATION OF ESTATES** ...property classification; property ownership; succession; wills; modification, revocation, drafting, execution; client contact; probate courts; trust classification; estate planning; ethics; personal representatives; formal probate; summary proceedings; informal probate. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-115 ADMINISTRATIVE LAW** ...the paralegal's role in preparation and representation of cases before administrative agencies, structure and authority of administrative agencies, procedures, and substantive state and federal administrative law. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-122 CREDITOR/DEBTOR RELATIONS** ...legal rights of creditors and debtors, collection of outstanding debts, execution of judgments, small claims court, bankruptcy procedures, and filing bankruptcy petitions and schedules. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-142 PARALEGAL INTERNSHIP** ...practical, hands-on experience in an approved office. Through the internship, the paralegal student has the opportunity to apply the theories, skills, and techniques that have been studied in the program. (Prerequisites: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better; 40 program credits; Prerequisite FOR PROGRAM ONLY: 10-110-102 Civil Litigation 1; Corequisite FOR CERTIFICATE ONLY: 10-110-102 Civil Litigation 1)

**10-110-143 PARALEGAL FIELD STUDY** ...in-depth study of an aspect of the legal field approved by the course instructor; an alternative to internship. (Prerequisite: 10-110-101, Paralegal Intro/Legal Ethics with a "C" or better; 40 program credits; Prerequisite FOR PROGRAM ONLY: 10-110-102, Civil Litigation 1; Corequisite FOR CERTIFICATE ONLY: 10-110-102, Civil Litigation 1)

**10-110-160 LAW-EMPLOYMENT** ...analyze federal and state laws governing employment relationships, job discrimination, sexual harassment, work place privacy, labor standards, and human resource management. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-168 PARALEGAL CRIMINAL PROCEDURES** ...substantive and procedural criminal law, the role of paralegals in both the prosecution and defense of criminal actions, emphasis on investigations and preparation of legal documents. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-169 INDIAN LAW** ...Wisconsin Indians, tribal sovereignty, federal/Indian relations, tribal governments, tribal courts, treaty making, removal/reservation life, assimilation, reorganization, termination, self-determination, gaming, and other contemporary issues. (Prerequisite FOR PROGRAM ONLY: 10-110-101, Paralegal Intro/Legal Ethics with "C" or better. Corequisite FOR CERTIFICATE ONLY: 10-110-101, Paralegal Intro/Legal Ethics)

**10-110-175 LEGAL COMPUTER APPLICATIONS** ...various computerized methods used to open new client files, organizing and maintaining documentation necessary for computerized litigation, document creation and law office administration. (Corequisite 10-110-101, Paralegal Intro/Legal Ethics)

**10-809-103 THINKING CRITICALLY & CREATIVELY** ...instruction in realistic/practical methods of thinking, including decision making, problem solving, analyzing ideas, troubleshooting, argumentation, persuasion, creativity, setting goals/objectives. Students apply strategies/tools in a variety of situations.

# Paramedic - Emergency Medical Technician

Program Code 305312

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Paramedic-Emergency Medical Technician students perform emergency patient care and advanced life support in the pre-hospital setting, transporting injured and ill patients to hospital emergency departments.

Successful completion of the Paramedic program prepares and entitles the student to take the National Registry licensing examination for EMT-Paramedics. A graduate is licensed as a paramedic only after successful completion of the licensing examination.

### Program Outcomes

- Perform patient assessment.
- Ventilate patients.
- Manage trauma and medical problems.
- Communicate patient information to hospital.
- Develop paramedic-patient interaction.
- Administer medications.
- Administer intravenous therapy.
- Interpret electrocardiograms.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Be currently licensed as an EMT in the State of Wisconsin.
- Students would be required to complete an additional course within the second semester that would permit the completion of the required field experience necessary to qualify for licensure.
- Students are required to maintain a current CPR card on a two-year renewal cycle to comply with affiliating agency requirements.
- NWTC is required to comply with the Wisconsin's Caregiver Law. For the most current information on the Caregiver Law, visit this website: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us)

### Employment Potential

A graduate of the program will have the potential for employment as a Paramedic.

**Paramedic:** performs advanced level pre-hospital care for paramedic level ambulance services and in hospital emergency departments. These could be either private or municipal employers.

### Note

#### *Strongly Recommended Course*

It is strongly recommended that students take this course in order to fulfill the course requirements and successfully complete the program.

Catalog No.	Description	Credits
30-531-326	Paramedic-Clinical 3	3
	Clinical Hours	216

### Curriculum

The Paramedic - EMT Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 24 credits.

#### First Semester

Catalog No.	Description	Credits
30-531-321	Paramedic Clinical 1	4
30-531-324	Paramedic Lab 1	2
30-531-330	Paramedic Principles 1A	3
30-531-331	Paramedic Principles 1B	3
<b>Semester Total</b>		<b>12</b>

#### Second Semester

30-531-323	Paramedic Clinical 2	4
30-531-325	Paramedic Lab 2	2
30-531-332	Paramedic Principles 2A	3
30-531-333	Paramedic Principles 2B	3
<b>Semester Total</b>		<b>12</b>
<b>Total Credits</b>		<b>24</b>

This program is fully eligible for financial aid.



### 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](http://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.*

**30-531-321 PARAMEDIC CLINICAL 1** ...paramedic-patient interactions, blood samples, patient assessment, intravenous therapy, airway management, medication administration, assessment/management of respiratory emergencies in supervised clinical practice, and skill development in an acute care hospital.

**30-531-323 PARAMEDIC CLINICAL 2** ...interpretation of electrocardiograms, assessment/management of cardiovascular, medical, trauma, pediatric, and obstetric emergencies in supervised clinical practice in an acute care hospital. (Prerequisite: 30-531-321, Paramedic Clinical 1)

**30-531-324 PARAMEDIC LAB 1** ...management of shock, respiratory, and cardiac emergencies; intravenous therapy; medication administration; endotracheal intubation; advanced airway management skills; and EKG monitoring.

**30-531-325 PARAMEDIC LAB 2** ...management of advanced cardiovascular emergencies, advanced trauma management skills, pediatric advanced life support skills, report and communication skills, and preparation skills for practical exam. (Prerequisite: 30-531-324, Paramedic Lab 1)

**30-531-330 PARAMEDIC PRINCIPLES 1A** ...roles and responsibilities of the paramedic, human systems and patient assessment, shock and fluid therapy, pharmacology, assessment/management of respiratory and cardiovascular emergencies. (Corequisite: 30-531-331, Paramedic Principles 1B)

**30-531-331 PARAMEDIC PRINCIPLES 1B** ...roles and responsibilities of the paramedic, human systems and patient assessment, shock and fluid therapy, pharmacology, assessment/management of respiratory and cardiovascular emergencies.

**30-531-332 PARAMEDIC PRINCIPLES 2A** ...cardiovascular, neurologic, obstetric and gynecologic, soft tissue, musculoskeletal, acute medical, pediatric, and psychiatric emergencies; operational aspects of EMS. (Corequisite: 30-531-333, Paramedic Principles 2B)

**30-531-333 PARAMEDIC PRINCIPLES 2B** ...cardiovascular, neurologic, obstetric and gynecologic, soft tissue, musculoskeletal, acute medical, pediatric, and psychiatric emergencies; operational aspects of EMS.



# Physical Therapist Assistant

Program Code 105241

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444

### Program Description

The Physical Therapist Assistant program educates students to carry out patients' rehabilitation programs under the supervision of a licensed physical therapist.

### Program Outcomes

- Demonstrate effective communication with patients, families, and health care team.
- Exhibit behaviors and conduct that reflect respect and sensitivity according to physical therapy practice standards.
- Function under the supervision of a physical therapist in a safe, legal, ethical manner.
- Produce documentation to support the delivery of physical therapy services.
- Demonstrate critical thinking skills to implement and adjust a plan of care under the direction and supervision of a physical therapist.
- Perform technically competent data collection under the direction and supervision of the physical therapist.
- Perform technically competent physical therapy interventions under the direction and supervision of the physical therapist.
- Educate patients, families, and other health providers.
- Integrate components of administrative, operational, and fiscal practices of physical therapy service in a variety of settings.
- Implement a self-directed plan for career development, credentialing, and lifelong learning.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances and participate in weekend rotations.

Students are required to complete an American Heart Association Health Care Provider CPR course prior to clinical experiences. Students are required to maintain a current CPR card to comply with affiliating agency requirements.

Students may be required to complete drug testing by clinical agencies.

### Employment Potential

A graduate of this program will have the potential for employment as a Physical Therapist Assistant. The State of Wisconsin does require a license to practice as a physical therapist assistant.

**Physical Therapist Assistant:** assists the physical therapist in the provision of physical therapy, performs physical therapy interventions and related tasks, carries out operational functions, makes modifications within the scope of the established plan of care, performs documentation and assessments under the direction and supervision of a physical therapist.

### Accreditation

The Physical Therapist Assistant Program at Northeast Wisconsin Technical College is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE) of the American Physical Therapy Association (APTA). The Commission on Accreditation in Physical Therapy Education  
Department of Accreditation  
American Physical Therapy Association  
1111 North Fairfax Street  
Alexandria, VA 22314  
Telephone: 703-706-3245  
Website: [www.apta.org/CAPTE](http://www.apta.org/CAPTE)

### Board/Certification Examinations

Graduates are eligible to take the Physical Therapist Assistant Examination through the National Physical Therapy Examination (NPTE).

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken with the last three years.
- One year of Algebra with a "C" or better (or attain program benchmark for Algebra on the Academic Skills Assessment).
- One year of Chemistry or Physics, or equivalent, with a grade of "C" or better. If in High School, "C" in two semesters of each.

### Priority Admission

Applicants with documentation of completion of General Anatomy and Physiology, with a "B" or better, will receive priority standing among that year's applicant pool.

### Requirements for Program Entry

- Meet established Academic Skills Assessment program benchmarks, or achieve minimum standard composite score of 20 on the ACT. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory spring program orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Submit Caregiver Background Check paperwork.
- Complete 20 hours of mandatory volunteer time within a healthcare setting or submit equitable work experience.

### Curriculum

The Physical Therapist Assistant Associate of Applied Science Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 70 credits.

#### First Semester

Catalog No.	Description	Credits
* 10-524-138	PTA Kinesiology 1	3
* 10-524-139	PTA Patient Interventions	4
* 10-524-140	PTA Professional Issues 1	2
10-801-196	Oral/Interpersonal Comm	3
* 10-806-177	Gen Anatomy & Physiology	4
<b>Semester Total</b>		<b>16</b>

#### Second Semester

* 10-524-141	PTA Kinesiology 2	4
* 10-524-142	PTA Therapeutic Exercise	3
* 10-524-143	PTA-Therapeutic Modalities	4
10-801-195	Written Communication	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>17</b>

#### Summer Semester

* 10-524-155	PTA Pediatrics	3
10-809-172	Race Ethnic & Diversity	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>9</b>

#### Third Semester

* 10-524-144	PTA Princ of Neuro Rehab	4
* 10-524-145	PTA Musculoskeletal Rehab	4
* 10-524-146	PTA Mgmt of Cardio & Integumen	3
* 10-524-147	PTA Clinical 1	2
10-809-188	Developmental Psychology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

* 10-524-148	PTA Clinical 2	3
* 10-524-149	PTA Rehab Across the Lifespan	2
* 10-524-150	PTA Professional Issues 2	2
* 10-524-151	PTA Clinical 3	5
<b>Semester Total</b>		<b>12</b>
<b>Total Credits</b>		<b>70</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

This program is fully eligible for financial aid.

### Suggested Skills for Success

Students are expected to have entry-level computer skills. It is recommended that students complete basic computer skills coursework if deficient in this area.

### Flexible Learning Option

A part-time track is available. This option is scheduled over an eleven-semester, four-year period including summer semesters. Individuals must request this option on their application.

### 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](http://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.*

**10-524-138 PTA KINESIOLOGY 1** ...introduces basic principles of musculoskeletal anatomy, kinematics, and clinical assessment. Students locate and identify muscles, joints, and other landmarks of the lower quadrant in addition to assessing range of motion and strength. (Prerequisite: Admission to the Physical Therapist Assistant program.)

#### **10-524-139 PTA PATIENT INTERVENTIONS**

...an introduction to basic skills and physical therapy interventions performed by the physical therapist assistant. (Prerequisite: Admission to the Physical Therapist Assistant program.)

**10-524-140 PTA PROFESSIONAL ISSUES 1** ...introduces the history and development of the physical therapy program, legal and ethical issues, the interdisciplinary health care team, and professional communication skills. (Prerequisite: Admission to the Physical Therapist Assistant program.)

**10-524-141 PTA KINESIOLOGY 2** ...applies basic principles from PTA Kinesiology 1 to the axial skeleton and upper quadrant including location and identification of muscles, joints and other landmarks. Integrate analysis of posture and gait. (Prerequisite: 10-524-138, PTA Kinesiology 1)

**10-524-142 PTA THERAPEUTIC EXERCISE** ...provides instruction on the implementation of a variety of therapeutic exercise principles. Learners implement, educate, adapt, and assess responses to therapeutic exercises. (Prerequisites: 10-806-177, General Anatomy & Physiology; 10-524-138, PTA Kinesiology 1)

**10-524-143 PTA-THERAPEUTIC MODALITIES** ...develops the knowledge and technical skills necessary to perform numerous therapeutic modalities likely to be utilized as a PTA. (Prerequisites: Admission to the Physical Therapist Assistant program; 10-524-139, PTA Patient Interventions)

**10-524-144 PTA PRINCIPLES OF NEUROMUSCULAR REHAB** ...integrates concepts of neuromuscular pathologies, physical therapy interventions, and data collection in patient treatment. (Prerequisites: 10-524-142, PTA Therapeutic Exercise; 10-524-141, PTA Kinesiology 2; 10-524-139, PTA Patient Interventions)

**10-524-145 PTA MUSCULOSKELETAL REHAB** ...integrates concepts of musculoskeletal pathologies, physical therapy interventions, and data collection in patient treatment. (Prerequisites: 10-524-142, PTA Therapeutic Exercise; 10-524-141, PTA Kinesiology 2; 10-524-139, PTA Patient Interventions)

**10-524-146 PTA MANAGEMENT OF CARDIOPULMONARY & INTEGUMENTARY CONDITIONS** ...integrates concepts of cardiopulmonary and integumentary pathologies, physical therapy interventions, and data collection in patient treatment. (Prerequisites: 10-524-139, PTA Patient Interventions; 10-524-142, PTA Therapeutic Exercise; 10-524-141, PTA Kinesiology 2)

**10-524-147 PTA CLINICAL PRACTICE 1** ...provides a part-time clinical experience to apply foundational elements, knowledge, and technical skills pertinent to physical therapy practice. (Prerequisites: 10-524-141, PTA Kinesiology 2; 10-524-143, PTA Therapeutic Modalities)

**10-524-148 PTA CLINICAL PRACTICE 2** ...provides another part-time clinical experience to apply foundational elements, knowledge, and technical skills required of the entry level physical therapist assistant in various practice settings. (Prerequisite: 10-524-147, PTA Clinical Practice 1)

**10-524-149 PTA REHABILITATION ACROSS THE LIFESPAN** ...a capstone course that integrates concepts of pathology, physical therapy interventions and data collection across the lifespan. The PTA's role in health, and physical therapy interventions for special patient populations. (Prerequisites: 10-524-144, PTA Principles of Neuromuscular Rehab; 10-524-145, PTA Principles of Musculoskeletal Rehab; 10-524-146, PTA Management of Cardiopulmonary & Integumentary Conditions; Corequisite: 10-524-148, PTA Clinical Practice 2)

**10-524-150 PTA PROFESSIONAL ISSUES 2** ...incorporates professional development, advanced legal and ethical issues, healthcare management and administration, and further development of professional communication strategies. (Prerequisite: 10-524-140, PTA Professional Issues 1; Corequisite: 10-524-148, PTA Clinical Practice 2)

**10-524-151 PTA CLINICAL PRACTICE 3** ...provides a full-time clinical experience to apply foundational elements, knowledge, and technical skills required of the entry level physical therapist assistant in various practice settings. (Prerequisites: 10-524-144, PTA Principles of Neuromuscular Rehab; 10-524-145, PTA Principles of Musculoskeletal Rehab; 10-524-146, PTA Management of Cardiopulmonary & Integumentary Conditions; Corequisite: 10-524-148, PTA Clinical Practice 2)

**10-524-155 PTA PEDIATRICS** ...normal and abnormal human development, pediatric pathologies and dysfunctions, and physical therapy treatment approaches. (Prerequisite: 10-524-142, PTA Therapeutic Exercise)



# Power Engineering and Boiler Operator

Program Code 304281

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Power Engineering and Boiler Operator prepares students to manage, operate, and control low (<15# steam pressure and high 15> pressure) boilers and auxiliary systems in factories, plants, and buildings.

### Program Outcomes

- Be skilled in the management of energy conservation.
- Define industry safety standards and concepts.
- Explain operation of power engineering equipment.
- Study the National Institute for Uniform Licensing of Power Engineering (NIULPE) Standards.
- Describe boiler operation effects on emission.
- Describe water treatment fundamentals related to power engineering equipment.
- Describe power engineering related to control fundamentals.
- Recognize power engineering related equipment type and terminology.
- Identify power engineering firing methods for different fuel types.
- Apply natural science fundamentals to power engineering industry.
- Relate electricity basics and general principles to power engineering.
- Study American Society of Power Engineers (ASOPE) Standards and Testing.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**3rd or 4th Class Power Engineer/Boiler Operator:** controls the operation of a boiler by reading gauges and varying fuel and water inputs.

**Boiler Service Technician:** services and repairs valves, fittings, and boiler tubes that are leaking or malfunctioning.

**Boiler Installer:** installs boilers, piping, controls, and auxiliary equipment.

**Boiler Chemical Sales Representative:** tests boiler water for chemical content and recommends additives to correct the water chemical content.

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

- Boiler Fuel Consultant
- Boiler Inspector
- Field Engineer
- Power Plant Supervisor

### Curriculum

The Power Engineering and Boiler Operator Technical Diploma is a two-year, part-time program. Upon graduation, a student will have completed 17 credits.

Catalog No.	Description	Credits
10-196-191	Supervision	3
10-804-106	Intro to College Math	3
30-403-338	Power House-Blueprint Rdg	1
30-413-345	Power House-Control Sys	1
30-413-347	Power House-Electric Sys	2
30-428-334	Power Engineering II	3
30-428-337	Power House-Economics	1
30-428-344	Power Engineering I	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>17</b>

This program is fully eligible for financial aid.

### 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](http://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.*

#### **30-403-338 POWER HOUSE-BLUEPRINT READING**

...footings and foundations, floor plans, elevations, below-grade piping, above-grade piping, isometric piping diagrams, schedules and details, electrical floor plans, ventilating, and air conditioning.

#### **30-413-345 POWER HOUSE-CONTROL SYSTEMS**

...boiler controls, ignition systems, analog logic symbols, burner management sequencing, flame rod and optical systems, boiler start-up/shut down, problem solving and troubleshooting techniques.

#### **30-413-347 POWER HOUSE-ELECTRICAL SYSTEMS**

...principles of electricity, tools required to troubleshoot, safety control, low-volt systems, utility provided power, troubleshooting power systems, motors and controller, wiring methods, transformers, and testing equipment.

**30-428-334 POWER ENGINEERING II** ...advanced training regarding the principles and operational techniques associated with power and heating boilers. Prepare students with competencies to take the ASOPE or NIUPE exams to qualify for 3rd class licensing. (Prerequisite: 30-428-344, Power Engineering I)

**30-428-344 POWER ENGINEERING I** ...boiler accidents, thermodynamics principles, high pressure steam boilers, boiler construction, fittings, instrumentation, controls, operation and maintenance, power plant pumps, refrigeration, air compression, prime movers, water treatment, electrical principles, support systems.



# Practical Nursing

Program Code 315431

## Technical Diploma

Offered at the Green Bay, Marinette and Sturgeon Bay campuses and at the West Regional Learning Center-Shawano.

For information in Green Bay: (920) 498-5444. For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900.

For information in Shawano: (715) 524-2418. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Practical Nursing graduates work in hospitals, nursing homes, clinics, community health agencies, and private homes. They give bedside care to patients whose conditions are relatively stable and assist the registered nurse or doctor in the care of the acutely ill person.

### Program Outcomes

- Adhere to standards of practice within legal, ethical, and regulatory frameworks of the licensed practical nurse.
- Use effective communications skills recognizing lifespan considerations.
- Assist with health assessment of individuals, families, and groups across the lifespan.
- Participate in clinical decision-making within the LPN scope of practice.
- Provide safe caring interventions with diverse populations across the lifespan.
- Use principles of teaching and learning processes to reinforce teaching plans recognizing lifespan considerations.
- Work cooperatively with others to provide holistic care.
- Under supervision, manage and direct care within and across health care setting according to established protocols.

### Requirements for Program Entry

- Attend mandatory orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course. Students are required to maintain a current CPR card to comply with affiliating agency requirements.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Employment Potential

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

**Licensed Practical Nurse:** administers care to individuals whose conditions are relatively stable; administers care to the acutely ill under the direct supervision of an RN or MD; teaches basic hygiene, nutrition, and aspects of good health; administers first aid; and assists with health assessment and basic health teaching in a variety of settings under the supervision of an RN or MD.

**Health Insurance Claims Approver:** processes insurance claims on a computer terminal.

### Accreditation

The Practical Nursing program is accredited by: Wisconsin Board of Nursing  
Dept of Regulation & Licensing  
1400 East Washington Street  
PO Box 8935  
Madison WI 53708-8935  
(608) 266-2112

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances, and participate in p.m. clinicals.

### Board/Certification Examinations

Graduates of the program are eligible to take the NCLEX-PN Examination for licensure as a Licensed Practical Nurse (LPN).

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment, ACT assessment taken within the last three years. Academic Skills Assessment program benchmarks, or minimum standard composite score of 18 on the ACT, must be met prior to submitting an application. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- All students must successfully complete a DHFS approved Nursing Assistant course prior to submitting an application to the program.

### Curriculum

The Practical Nursing Technical Diploma is a three-semester program. Upon graduation, a student will have completed 30 credits.

#### First Semester

Catalog No.	Description	Credits
10-801-195	Written Communication	3
* 31-806-312	Anatomy/Struct-Funct	2
<b>Semester Total</b>		<b>5</b>

#### Second Semester

10-809-188	Developmental Psychology	3
* 31-543-301	Nursing Fundamentals	2
* 31-543-302	Nursing Skills	3
* 31-543-303	Nursing Pharmacology	2
* 31-543-304	Nsg: Intro to Clinical Practice	2
<b>Semester Total</b>		<b>12</b>

#### Third Semester

10-801-196	Oral/Interpersonal Comm	3
* 31-543-305	Nursing Health Alterations	3
* 31-543-306	Nursing Health Promotion	3
* 31-543-307	Nsg: Clin Care Across Lifespan	2
* 31-543-308	Nsg: Intro Clinical Care Mgt	2
<b>Semester Total</b>		<b>13</b>
<b>Total Credits</b>		<b>30</b>

\*No final grade lower than a "C" is acceptable in the nursing or natural science courses marked with an asterisk. A student must repeat the particular course with "C" or better final grade to continue in or graduate from this program. If the course is sequential, the successful retake must occur before continuing the sequence.

### NOTE

- Individuals with criminal records may be ineligible for licensure. Individuals with abuse records may be ineligible for employment in nursing homes.
- It is suggested that a Medical Terminology course (10-501-101) be taken prior to entering the program.

### Flexible Learning Option

A part-time program format is available. This option is scheduled over six semesters including two summer semesters. Each semester has four to six credits. For details, please refer to the part time Practical Nursing brochure.

This program is fully eligible for financial aid.



## 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](http://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.*

**31-543-301 NURSING FUNDAMENTALS** ...focuses on basic nursing concepts that the beginning nurse will need to provide care to diverse patient populations across the lifespan. Current and historical issues impacting nursing will be explored within the scope of nursing practice. The nursing process will be introduced as a framework for organizing the care of patients with alterations in cognition, elimination, comfort, grief/loss, mobility, integument, and fluid/electrolyte balance. (Prerequisite: Accepted into Practical Nursing Program; Corequisites: 31-806-312, Anatomy/Structure Function; 31-543-302, Nursing Skills; 31-543-303, Nursing Pharmacology; 31-543-304, Nursing: Introduction to Clinical Practice)

**31-543-302 NURSING SKILLS** ...focuses on development of clinical skills and physical assessment across the lifespan. Content includes mathematic calculations and conversions related to clinical skills, blood pressure assessment, aseptic technique, wound care, oxygen administration, tracheostomy care, suctioning, management of enteral tubes, basic medication administration, glucose testing, enemas, ostomy care, and catheterization. In addition the course includes techniques related to obtaining a health history and basic physical assessment skills using a body systems approach. (Prerequisite: Accepted into Practical Nursing Program; Corequisite: 31-806-312, Anatomy/Structure Function; 31-543-301, Nursing Fundamentals; 31-543-303, Nursing Pharmacology; 31-543-304, Nursing: Introduction to Clinical Practice)

**31-543-303 NURSING PHARMACOLOGY** ...this course introduces the principles of pharmacology, including drug classifications and their effects on the body. Emphasis is on the use of the components of the nursing process when administering medications. (Prerequisite: Accepted into Practical Nursing Program; Corequisites: 31-806-312, Anatomy/Structure Function; 31-543-301, Nursing Fundamentals; 31-543-302, Nursing Skills; 31-543-304, Nursing: Introduction to Clinical Practice)

**31-543-304 NSG: INTRO TO CLINICAL PRACTICE** ...this introductory clinical course emphasizes basic nursing skills and application of the nursing process in meeting the needs of diverse clients across the lifespan. Emphasis is placed on performing basic nursing skills, the formation of nurse -client relationships, communication, data collection, documentation, and medication administration. (Prerequisite: Accepted into Practical Nursing Program; Corequisites: 31-806-312, Anatomy/Structure Function; 31-543-301, Nursing Fundamentals; 31-543-302, Nursing Skills; 31-543-303, Nursing Pharmacology )

**31-543-305 NURSING HEALTH ALTERATIONS** ...this course elaborates upon the basic concepts of health and illness as presented in Nursing Fundamentals. It applies theories of nursing in the care of clients through the lifespan, utilizing problem solving and critical thinking. This course will provide an opportunity to study conditions affecting different body systems and apply therapeutic nursing interventions. It will also introduce concepts of leadership, team building, and scope of practice. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-308, Nursing: Intro to Clinical Management)

**31-543-306 NURSING HEALTH PROMOTION** ...this course focuses on topics related to health promotion for individuals and families throughout the lifespan. We will cover nursing care of the developing family, which includes reproductive issues, pregnancy, labor and delivery, post-partum, the newborn, and the child. Recognizing the spectrum of healthy families we will discern patterns associated with adaptive and maladaptive behaviors applying mental health principles. An emphasis is placed on teaching and supporting healthy lifestyles choices for individuals of all ages. Nutrition, exercise, stress management, empowerment, and risk reduction practices are highlighted. Study of the family will cover dynamics, functions, discipline styles, and stages of development. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-307, Nursing: Clinical Care Across Lifespan)

**31-543-307 NSG:CLIN CARE ACROSS LIFESPAN** ...this clinical experience applies nursing concepts and therapeutic interventions to clients across the lifespan. It also provides an introduction to concepts of teaching and learning. Extended care to include the family is emphasized. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-306, Nursing Health Promotion)

**31-543-308 NSG: INTRO CLINICAL CARE MGT** ...this clinical experience applies nursing concepts and therapeutic nursing interventions to groups of clients across the lifespan. It also provides an introduction to leadership, management, and team building. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-305, Nursing Health Alterations)

**31-806-312 ANATOMY/STRUCTURE-FUNCTION** ...human body systems, structural formation.

# Print Technology

Program Code 312041

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Print Technology program trains students in pre-press operations, offset presswork, computer-to-plate imaging, finishing processes, electronic publishing, and digital print applications.

### Program Outcomes

- Analyze jobs for operations and materials costs.
- Perform electronic pre-press operations.
- Lay out jobs and generate CTP (computer-to-plate) production.
- Create press proofs.
- Set up and operate offset and digital printing presses.
- Maintain a safe work environment.
- Create machine operation procedures.
- Pre-flight jobs for various printing processes.
- Perform finishing operations on printed jobs.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Communication skills.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Digital Output Operator:** produces print communication using digital output devices and computer workflow systems. Manages print quality on full color and monochrome projects.

**Offset/Press Operator:** sets up, prepares and operates presses; loads paper, installs printing plates, adjusts guides and control for machine operations.

**Offset/Press Assistant:** prepares press for run; runs press proof; adjusts plate, paper feed, tension of paper; ink and water flow.

**Large Format Output Operator:** produce large format signage on different substrates.

**Bindery/Finishing Operator:** operates machines that cut, fold, collate, staple, stitch, trim, and bind pages.

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

- Graphic Designer
- Pre-Press Technician
- Print Production Supervisor/Manager
- Estimator
- Pre-Flight Specialist
- Customer Service Representative

### Curriculum

The Print Technology Technical Diploma is a one-year, two-semester program. Upon graduation, students will have completed 31 credits.

#### First Semester

Catalog No.	Description	Credits
10-111-103	Graphic Workstations	1
10-111-161	Macintosh Illustration	3
10-204-110	Publishing Technologies	3
10-204-111	Digital Publishing Operations	3
10-204-124	Variable Data Publishing	3
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-111-101	Macintosh-Image Editing	3
10-111-125	Graphic Reproduction Tech	3
10-204-126	Digital Print Applications	3
10-204-128	Digital Fulfillment/Mailing	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>31</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**10-111-101 MACINTOSH-IMAGE EDITING** ...(Adobe Photoshop + Adobe Acrobat) scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print. An introduction to manipulating bitmap images. (Corequisite: 10-111-103, Graphic Workstations)

**10-111-103 GRAPHIC WORKSTATIONS** ...explore the Macintosh Operating System and applications including iPhoto, iTunes, iMovie, GarageBand, FontBook, Sherlock, iCal, AddressBook and Dashboard. Learn to navigate the Mac Operating System and manage files and folders.

**10-111-125 GRAPHIC REPRODUCTION TECHNIQUES** ...basic process of reproducing images using offset lithography including electronic imaging, preflighting, trapping concepts, imposition, and collect for output. (Prerequisites: 10-111-103, Graphic Workstations; 10-111-120, Macintosh Publishing)

**10-111-161 MACINTOSH ILLUSTRATION** ...create and paint basic shapes, draw, transform objects, work with type, blend shapes and colors, work with layers, special effects, and color separations. An introduction to manipulating vector based images. (Corequisite: 10-111-103, Graphic Workstations)

**10-204-110 PUBLISHING TECHNOLOGIES** ...introduction to printing process, electronic publishing, prepress operations, press operations, postpress operations, job logs, professional portfolios, and job seeking skills. (Corequisite: 10-111-103, Graphic Workstations)

**10-204-111 DIGITAL PUBLISHING OPERATIONS** ...press equipment, processors, inks, print quality, job tickets, standard operating procedures, densitometers, printing problems, and trapping situations. (Prerequisite: 10-111-103, Graphic Workstations)

**10-204-124 VARIABLE DATA PUBLISHING** ...learn how to link database files to page layout applications. Create and manage correct variable channels in page layouts, apply text and image changes to layout to create a personalized printed page, research how the information is gathered to create personalized content.

**10-204-126 DIGITAL PRINT APPLICATIONS** ...explain why the industry is in a state of transition towards digital printing, outline the proper time to select digital printing as a production tool; what type of project fits well into a digital print environment, identify what type of project fits the mold of digital printing.

**10-204-128 DIGITAL FULFILLMENT AND MAILING** ...learn different ordering processes for digital printing, outline mailing regulations in regards to variable data printing, explain the differences in digital print industry segments, outline deliverable standards in regards to digital print processes, outline how digital printing can be a component to a successful marketing campaign.



# Prototype and Design

Program Code 106142

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Prototype and Design program prepares students to build a variety of three dimensional prototypes and models used in the design and engineering industry.

Students learn to develop prototypes for use in the manufacturing of automobiles, toys, and various stages of product development.

They also learn to build three-dimensional models used for architectural design, mechanical design, litigation, props, special effects and the entertainment industry.

### Program Outcomes

- Develop planning strategies necessary to translate two-dimensional information into a three dimensional prototype.
- Use critical thinking and problem solving techniques in the construction of a prototype.
- Create a variety of computer aided drawings using AutoCAD, Solidworks and Inventor.
- Create programs to be used on CNC (computer numerical control) milling machines using Surf CAM software.
- Construct 3D models using a variety of rapid prototyping processes.
- Produce highly detailed and accurate parts using the laser machining center.
- Fabricate silicone rubber molds and rigid molds suitable for casting.
- Build patterns and molds to be used for vacuum forming.
- Create jigs and fixtures necessary for special machining operations.
- Select and apply a variety of industrial finishes on various materials.
- Effectively estimate the time and cost to design and fabricate a prototype.
- Manage computer files and utilize a variety of technically related software.
- Work efficiently as a part of a team, or independently.
- Safely operate all hand tools, metalworking, and woodworking equipment typically used in a professional model shop.
- Effectively select appropriate materials and adhesives and understand their properties.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics and science.
- High school algebra or equivalent.

### Employment Potential

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

**Product Development:** develops and designs new products through the use of prototypes.

**Prototype Model Builder:** provides research and development on new products, works with molding, and makes models for all types of industries, such as toy and automobile manufacturers, so that the prototype will look like the finished product before production begins.

**Engineering Design:** translates engineering data and vendor information into scale prototypes or CAD models for use with Rapid Prototyping Processes. Usually employed in design and development of new products or systems.

**Architectural Model Builder:** translates, to scale, all architectural drawings using plot plans, elevations, sections, and details to construct three dimensional models using a wide variety of materials and processes.

**Legal Model Builder:** creates models that help win court cases by allowing a judge and jury to see a three-dimensional representation of the scene of an accident, injury, or crime.

**Props and Special Effects Model Builder:** makes models for the movie, television, and stage play industries.

**Pattern and Mold Maker:** fabricates wood, plastic, or metal patterns and molds for casting parts.

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

- Mechanical Prototype Designer
- Model Shop Supervisor
- Computer Numerical Control Machinery Programmer/Operator
- Rapid Prototyping Operator
- Architectural Designer/Model Builder
- Free-Lance Model Builder

### Curriculum

The Prototype and Design Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-420-151	Prototype Machine Tool	3
10-606-113	CAD	2
10-614-113	2D Essentials	2
10-614-152	Prototyping-Introduction to	5
10-801-196	Oral/Interpersonal Comm	3
10-804-110	Elem Algebra w Apps	3
<b>Semester Total</b>		<b>18</b>

#### Second Semester

10-442-153	Prototype Metal Fabrication	2
10-614-122	Prototype Design	3
10-614-124	Design Visualization	5
10-801-195	Written Communication	3
10-804-118	Interm Algebra w Apps	4
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-614-134	Engineering Models	5
10-614-136	Modeling 3D-CAD	3
10-614-138	CNC Maching-Adv	3
10-614-176	Model Finishing	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-614-143	Prototyping Solutions Advanced	5
OR		
10-614-139	Prototype & Design Internship	5
10-614-150	Visual Effects Modeling	3
10-614-174	Models-Machine	2
10-809-166	Intro to Ethics: Theory & App	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

### 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](http://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.*

#### 10-420-151 PROTOTYPE MACHINE TOOL

...introduction to machine shop fundamentals using precision measuring instruments; performing machine tool operations on a metal lathe, vertical and horizontal milling machines and surface grinders; and basic foundry applications.

#### 10-442-153 PROTOTYPE METAL FABRICATION

...ferrous and non-ferrous metals, oxyacetylene gas, tungsten arc, gas metal arc, and metal fabrication. (Corequisite: 10-606-122, CAD Fab & Assembly; OR 10-614-122, Prototype Design)

#### 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. (Corequisite: 10-607-119, Civil Drafting Technology OR 10-606-119, Technical Sketching OR 10-614-113, 2D Essentials)

**10-614-113 2D ESSENTIALS** ...an introduction to technical communication, annotation, geometric construction, model, orthographic and pictorial, section and auxiliary views and dimensioning. Knowledge integral to Model Building.

**10-614-122 PROTOTYPE DESIGN** ...creation of advanced mechanical and architectural computer aided drawings using AutoCAD, Solidworks, and Surf CAM software to produce 2 axis and 3 axis parts on a CNC milling machine. (Prerequisites: 10-606-113, CAD; 10-614-152, Prototyping-Introduction to; Corequisite: 10-614-124, Design Visualization)

**10-614-124 DESIGN VISUALIZATION** ...planning and construction stages of product models and architectural models focusing on fabrication methods, material selection, CNC machining, painting and finishing techniques, and model photography. (Prerequisites: 10-614-152, Prototyping-Introduction to; 10-606-113, CAD; Corequisite: 10-614-122, Prototype Design)

#### 10-614-134 ENGINEERING MODELS

...engineering/design modeling, power and hand tools, materials and techniques; job responsibilities and relations with other disciplines; constructing engineering/design models; basic mold making; and Rapid Prototyping model processes. (Corequisite: 10-614-152, Prototyping-Introduction to)

#### 10-614-136 MODELING 3D-CAD

...solid modeling(3D drawing) using AutoCAD, Solidworks, and Inventor software; and 3D solid models/ drawings; rapid prototyping; importing and exporting of data. (Prerequisite: 10-606-113, CAD)

**10-614-138 CNC MACHINING-ADVANCED** ...create two and three dimensional drawings, and tool paths using SurfCAM software. Parts will be machined on the CNC milling machine using materials typically used in the model building industry. (Prerequisites: 10-614-122, Prototype Design; 10-614-124, Design Visualization)

**10-614-139 PROTOTYPE & DESIGN INTERNSHIP** ...an introduction to model building, safety, tools, materials, flexible mold making, casting, limited run production, techniques and practices as on-the-job training.

#### 10-614-143 PROTOTYPING SOLUTIONS ADVANCED

...an introduction to Product and Prototype modeling, safety, tools, materials, plastics, reinforcement, composites, flexible mold making, casting, limited run production, techniques and practices. (Prerequisite: 10-614-152, Prototyping-Introduction to)

**10-614-150 VISUAL EFFECTS MODELING** ...create foam latex masks from a clay sculpture that could be used as special effects in the entertainment industry. Learn to animate masks and props using radio control. (Prerequisite: 10-614-152, Prototyping-Introduction to)

#### 10-614-152 PROTOTYPING-INTRODUCTION TO

...introduction to 3D model building using a variety of materials, machine processes, and fabrication techniques including CNC milling with an emphasis on accuracy, professionalism, and working within specified tolerances.

**10-614-174 MODELS-MACHINE** ...working models, preliminary through final prototype; plastic mechanisms, motions, characteristics, combinations, mechanical advantages, fits, clearances, threads, gears, levers, cams, motors, fasteners, and methods. (Prerequisite: 10-614-152, Prototyping-Introduction to)

**10-614-176 MODEL FINISHING** ...use a variety of methods to apply finishes most commonly used in the prototype profession. Finishes will be applied using airbrushes and different types of spray guns. The types of finishes used will be various automotive and industrial finishes. A three dimensional museum quality diorama will also be fabricated.



# Radiography

Program Code 105261

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Graduates perform routine radiographic imaging of the body. They work closely with physicians and may assist in the performance of invasive procedures. After completion of the program, many students may choose to acquire advanced certificates in Mammography, Bone Densitometry, Computer Tomography (CT), and/or Magnetic Resonance Imaging (MRI).

### Program Outcomes

- Carry out the production and evaluation of radiographic images.
- Practice radiation safety principles.
- Adhere to quality management processes in radiography.
- Provide quality patient care.
- Apply computer skills in the radiographic clinical setting.
- Model professional and ethical behavior consistent with the A.R.R.T. Code of Ethics.
- Apply critical thinking and problem solving skills in the practice of diagnostic radiography.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances, participate in p.m. clinicals, or weekend rotations.

### Accreditation

The Radiography program is accredited by the North Central Association of Colleges and Schools, 30 North LaSalle Street, Suite 2400, Chicago, Illinois 60602.

### Board/Certification Examinations

Graduates are qualified to take the American Registry in Radiography Technologist (ARRT) Examination.

### Employment Potential

A graduate of the Radiography program can choose to work in a variety of health care settings including clinics, hospitals and private practice physician offices.

Career advancement opportunities exist in education, administration, and in commercial companies as education/application specialists, sales representatives and technical advisors.

### Requirements for Program Application

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment, ACT assessment taken within the last three years.
- One year of Algebra and Chemistry with a grade of "C" or better. If high school courses, "C" in two semesters of each.

Candidates submitting applications to the Radiography program must also provide:

- Three references from professional or academic experiences submitted on NWTC forms.
- An essay (no more than 1,000 words) completed on campus in the Assessment Center in a timed setting. The essay must include why they are interested in and their knowledge of the profession, experience in healthcare, specific skills and duties of a radiographer, and characteristics that make them a good candidate for the program.

The Radiography program follows a competitive enrollment process whereby candidate applications are reviewed by a Selection Committee. Candidates are ranked in the following categories: Assessment, Math/Science, Essays, References. The highest ranking candidates will be offered a place on the program wait list. Remaining candidates will have the opportunity to re-apply.

### Requirements for Program Entry From Wait List

- Attend mandatory spring program orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card to comply with affiliating agency requirements.
- Submit Caregiver Background Check paperwork.
- Complete mandatory four hour job shadow.

### Curriculum

The Radiography program is a two-year, two-summer, six-semester program. Upon graduation, a student will have completed 70 credits.

Summer semester core classes are scheduled to begin mid-May and end mid-July.

#### Summer Semester

Catalog No.	Description	Credits
10-801-196	Oral/Interpersonal Comm	3
* 10-806-177	Gen Anatomy & Physiology	4
<b>Semester Total</b>		<b>7</b>

#### First Semester

* 10-526-149	Radiographic Procedures 1	5
* 10-526-158	Introduction to Radiography	3
* 10-526-159	Radiographic Imaging 1	3
* 10-526-168	Radiography Clinical 1	2
* 10-526-195	Radiographic Quality Analysis	2
<b>Semester Total</b>		<b>15</b>

#### Second Semester

* 10-526-170	Radiographic Imaging 2	3
* 10-526-189	Radiographic Pathology	1
* 10-526-191	Radiographic Procedures 2	5
* 10-526-192	Radiography Clinical 2	3
10-809-166	Intro to Ethics: Theory & App	3
<b>Semester Total</b>		<b>15</b>

#### Summer Semester

* 10-526-193	Radiography Clinical 3	3
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>6</b>

#### Third Semester

* 10-526-194	Imaging Equipment Operations	3
* 10-526-196	Modalities	3
* 10-526-197	Radiation Protection & Biology	3
* 10-526-199	Radiography Clinical 4	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>15</b>

#### Fourth Semester

* 10-526-174	ARRT Certification Seminar	2
* 10-526-190	Radiography Clinical 5	2
* 10-526-198	Radiography Clinical 6	2
10-801-195	Written Communication	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>12</b>
<b>Total Credits</b>		<b>70</b>

\* No final grade lower than "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or received a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

### Suggested Skills for Success

Students are expected to have entry-level computer skills. It is recommended that students complete basic computer skills coursework if deficient in this area.

This program is fully eligible for financial aid.



## 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](http://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.*

**10-526-149 RADIOGRAPHIC PROCEDURES 1** ...prepares radiography students to perform routine radiologic procedures on various parts of the body including the upper body, hip, pelvis and ankle. Students apply knowledge of human anatomy to position the patient correctly to achieve the desired result. (Prerequisites: Enrolled in Radiography program; 10-806-177, General Anatomy & Physiology)

**10-526-158 INTRODUCTION TO RADIOGRAPHY** ...introduces students to the role of radiography in health care. Students apply medical terminology, legal and ethical considerations to patient care and pharmacology in the radiologic sciences. (Prerequisite: Enrolled in Radiography program)

**10-526-159 RADIOGRAPHIC IMAGING 1** ...introduces radiography students to the process and components of analog imaging. Students determine the factors that affect image quality including contrast, density, detail, and distortion. (Prerequisite: Enrolled in Radiography program)

**10-526-168 RADIOGRAPHY CLINICAL 1** ...this beginning level clinical course prepares radiography students to perform radiologic procedures on patients with extensive supervision and direction. Students apply radiation protection and standard precautions in the production of radiographs in the health care setting while adhering to legal and ethical guidelines. An emphasis of the course is the development of communication and critical thinking skills appropriate to the clinical setting. (Prerequisites: Enrolled in Radiography program; 10-806-177, General Anatomy & Physiology; Corequisites: 10-526-158, Introduction to Radiography; 10-526-149, Radiographic Procedures 1; 10-526-159, Radiographic Imaging)

**10-526-170 RADIOGRAPHIC IMAGING 2** ...explores film processing components as well as the principles and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Guidelines for selecting exposure factors and evaluating images within analog and digital systems. Principles of digital system quality assurance and maintenance are presented. (Prerequisites: Enrolled in Radiography program; 10-526-159, Radiographic Imaging 1)

**10-526-174 ARRT CERTIFICATION SEMINAR** ...provides preparation for the national certification examination prepared by the American Registry of Radiologic Technologists. Emphasis is placed on the weak areas of the individual students. Simulated registry examinations are utilized. (Prerequisite: Enrolled in Radiography program or consent of program director)

**10-526-189 RADIOGRAPHIC PATHOLOGY** ...prepares radiography students to determine the basic radiographic manifestations of pathological conditions. Students classify trauma related to site, complications, and prognosis and locate the radiographic appearance of pathologies. (Prerequisite: Enrolled in Radiography program)

**10-526-190 RADIOGRAPHY CLINICAL 5** ...this fifth level clinical course prepares radiography students to perform radiologic procedures on patients with some supervision. Students apply radiation protection and standard precautions in the production of radiographs in a health care setting while adhering to legal and ethical guidelines. Students are encouraged to demonstrate independent judgment in the performance of clinical competencies. (Prerequisite: 10-526-199, Radiography Clinical 4)

**10-526-191 RADIOGRAPHIC PROCEDURES 2** ...prepares radiography students to perform routine radiologic procedures on various parts of the body including the skull and spine. Students apply knowledge of human anatomy to position the patient correctly to achieve the desired result. (Prerequisites: Enrolled in Radiography program; 10-526-149, Radiographic Procedures 1; 10-806-177, General Anatomy & Physiology)

**10-526-192 RADIOGRAPHY CLINICAL 2** ...this second level clinical course prepares radiography students to perform radiologic procedures on patients with extensive supervision and direction. Students apply radiation protection and standard precautions in the production of radiographs in a health care setting while adhering to legal and ethical guidelines. An emphasis of the course is the development of communication and critical thinking skills appropriate to the clinical setting. (Prerequisite: 10-526-168, Radiography Clinical 1)

**10-526-193 RADIOGRAPHY CLINICAL 3** ...this third level clinical course prepares radiography students to perform radiologic procedures on patients with supervision and direction. Students apply radiation protection and standard precautions in the production of radiographs in a health care setting while adhering to legal and ethical guidelines. An emphasis of the course is the demonstration of communication and critical thinking skills appropriate to the clinical setting. (Prerequisite: 10-526-192, Radiography Clinical 2)

**10-526-194 IMAGING EQUIPMENT OPERATIONS** ...introduces radiography students to the principles and application of x-ray technology. Students analyze how x-rays are produced and determine the corrective actions necessary for common equipment malfunctions. (Prerequisite: Enrolled in Radiography program)

**10-526-195 RADIOGRAPHIC QUALITY ANALYSIS** ...prepares radiography students to analyze radiographic images for quality. Students apply quality control tests to determine the causes of image problems including equipment malfunctions and procedural errors. (Prerequisite: Enrolled in Radiography program)

**10-526-196 MODALITIES** ...introduces radiography students to imaging modalities with an emphasis in computed tomography and cross-sectional anatomy. (Prerequisite: Enrolled in Radiography program or consent of program director)

**10-526-197 RADIATION PROTECTION & BIOLOGY** ...prepares radiography students to protect themselves and others from exposure to radioactivity. Students examine the characteristics of radiation and how radiation affects cell biology. Students apply standards and guidelines for radiation exposure. (Prerequisite: Enrolled in Radiography program or consent of program director)

**10-526-198 RADIOGRAPHY CLINICAL 6** ...this final clinical course requires students to integrate and apply all knowledge learned in previous courses to the production of high quality images in the clinical setting. Students apply radiation protection and standard precautions in the production of images in a health care setting while adhering to legal and ethical guidelines. Students are encouraged to demonstrate independent judgment in the performance of clinical competencies. (Prerequisite: 10-526-190, RT-Clinical Practice 5)

**10-526-199 RADIOGRAPHY CLINICAL 4** ...this fourth level clinical course prepares radiography students to perform radiologic procedures on patients with supervision and direction. Students apply radiation protection and standard precautions in the production of radiographs in a health care setting while adhering to legal and ethical guidelines. Students are encouraged to demonstrate independent judgment in the performance of clinical competencies. (Prerequisite: 10-526-193, Radiography Clinical 3)

# Respiratory Therapist

Program Code 105151

## Associate Degree

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Respiratory Therapist program trains students in the diagnosis, treatment, and rehabilitation of patients with chronic and acute disease of the heart and lungs.

### Program Outcomes

- Apply advanced-level respiratory therapy concepts to patient care situations.
- Practice respiratory therapy according to established professional and ethical standards.
- Demonstrate technical proficiency required to fulfill the role of an advanced-level Respiratory Therapist.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Clinical Experience

Students will be required to purchase a uniform, pay for liability insurance, provide their own transportation to assigned sites, and cover any expenses related to clinical experiences. Students may be expected to travel distances, participate in p.m. clinicals, or weekend rotations.

### Accreditation

The Respiratory Therapist program is accredited by the Committee on Accreditation for Respiratory Care (CoARC)  
1248 Harwood Road  
Bedford, TX 76021-4244  
(817) 283-2835

### Board/Certification Examinations

Graduates are eligible to take the National Board for Respiratory Care Credentialing Examinations.

### Employment Potential

A graduate of this program will have the potential for employment in a hospital, nursing home, and homecare setting as a:

- Staff Therapist
- Pulmonary Rehabilitation Therapist
- Perinatal/Pediatric Therapist
- Pulmonary Function Technologist
- Sleep Disorder Center Technician
- Shift Supervisor
- Department Manager
- Home Care Therapist/Manager
- Nursing Home Therapist
- Respiratory Care Educator
- Medical Equipment and Supplies Sales Representative

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment or ACT assessment taken within the last three years.
- One year of Algebra with a "C" or better (or attain program benchmark for Algebra on the Academic Skills Assessment).
- One year of Biology AND one year of Chemistry, or equivalent, with a grade of "C" or better. If in high school, "C" in two semesters of each.
- One year of Physics OR one year of advanced math, or equivalent, with a grade of "C" or better. If in high school, "C" in two semesters of each.

### Priority Admission

Applicants with documentation of completion of General Anatomy and Physiology, with a "B" or better, will receive priority standing among that year's applicant pool.

### Requirements for Program Entry

- Meet established Academic Skills Assessment program benchmarks, or achieve minimum standard composite score of 20 on the ACT. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory spring program orientation.
- Complete physical examination within three months before entering program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course. Students are required to maintain a current CPR card to comply with affiliating agency requirements.
- Submit Caregiver Background Check paperwork.
- Complete optional four hour job shadow.

### Curriculum

The Respiratory Therapist Associate Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 70 credits.

Summer semester core classes are scheduled to begin mid-May and end mid-July.

#### First Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
* 10-515-170	Respiratory Therapy Survey	4
10-801-196	Oral/Interpersonal Comm	3
* 10-806-177	Gen Anatomy & Physiology	4
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

* 10-515-171	Respiratory Therapeutics 1	3
* 10-515-173	Respiratory Pharmacology	3
* 10-515-174	Respiratory & Circulatory Phys	3
10-801-195	Written Communication	3
* 10-806-197	Microbiology	4
<b>Semester Total</b>		<b>16</b>

#### Summer Semester

* 10-515-172	Respiratory Therapeutics 2	3
* 10-515-175	Respiratory Therapy Clinical 1	2
<b>Semester Total</b>		<b>5</b>

#### Third Semester

* 10-515-176	Respiratory Disease	3
* 10-515-177	Respiratory Life Support	4
* 10-515-178	Respiratory Therapy Clinical 2	3
* 10-515-179	Respiratory Therapy Clinical 3	3
10-809-196	Intro to Sociology	3
<b>Semester Total</b>		<b>16</b>

#### Fourth Semester

* 10-515-162	Clinical Simulation Rev 1	1
* 10-515-163	Clinical Simulation Rev 2	1
* 10-515-180	Respiratory Neonatal/Peds Care	2
* 10-515-181	Respiratory Diag & Monitor	3
* 10-515-182	Respiratory Therapy Clinical 4	3
* 10-515-183	Respiratory Therapy Clinical 5	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>16</b>
<b>Total Credits</b>		<b>70</b>

\*No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receives a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

This program is fully eligible for financial aid.

## 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](http://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.*

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

### **10-515-162 CLINICAL SIMULATION REVIEW 1**

...preparation for the testing processes utilized by the National Board for Respiratory Care; all testing processes will be reviewed utilizing appropriate content. (Corequisites: 10-515-182, Respiratory Therapy Clinical 4; 10-515-183, Respiratory Therapy Clinical 5)

**10-515-163 CLINICAL SIMULATION REVIEW 2** ...the diagnosis, management, and treatment received by cardiopulmonary patients. (Corequisites: 10-515-182, Respiratory Therapy Clinical 4; 10-515-183, Respiratory Therapy Clinical 5)

### **10-515-170 RESPIRATORY THERAPY SURVEY**

...examines the role of the respiratory therapist within the healthcare community. Reviews the ethical, legal, and regulatory principles that guide practice across diverse populations. Introductory patient assessment and critical thinking processes used in the development of respiratory care plans are explored. (Prerequisite: Accepted into Respiratory Therapy program)

### **10-515-171 RESPIRATORY THERAPEUTICS 1**

...introduces the topics of medical gas administration and humidity and aerosol therapy. The learner will apply physics, math and patient assessment concepts to oxygen, aerosol and humidity. (Prerequisites: 10-515-170, Respiratory Therapy Survey; 10-806-177, General Anatomy & Physiology)

### **10-515-172 RESPIRATORY THERAPEUTICS 2**

...introduces therapeutic procedures including arterial puncture, bronchial hygiene, lung expansion therapy and pulmonary rehabilitation. (Prerequisite: 10-515-171, Respiratory Therapeutics 1)

### **10-515-173 RESPIRATORY PHARMACOLOGY**

...examines basic pharmacology principles, drug dosage, and calculations. Medications for inhalation including mucolytics, bronchodilators, anti-inflammatories. Also includes cardiac drugs, anesthetic drugs, neuromuscular blockers and antimicrobials. (Prerequisite: 10-806-177, General Anatomy & Physiology)

### **10-515-174 RESPIRATORY & CIRCULATORY PHYSIOLOGY**

...provides the student with an in depth knowledge of the structure and function of the respiratory and circulatory systems necessary to function as a competent Respiratory Therapist. (Prerequisite: 10-806-177, General Anatomy & Physiology)

### **10-515-175 RESPIRATORY THERAPY CLINICAL PRACTICE 1**

...introduces respiratory therapy practice in the hospital setting. Includes the development of skills such as basic therapeutics, patient assessment, medical record review, safety practices, patient interaction and communication. This course includes the complete program competency list. At the completion of this clinical learners must demonstrate competence in a minimum of 5 (required and/or simulated) competencies. The instructor may identify specific competencies to be addressed during this or any clinical. (Prerequisites: 10-515-170, Respiratory Therapy Survey; 10-515-171, Respiratory Therapeutics 1; Corequisites: 10-501-101, Medical Terminology; 10-515-172 Respiratory Therapeutics 2)

**10-515-176 RESPIRATORY DISEASE** ...exploration of signs, symptoms, causes, progression and treatment of obstructive, restrictive and infectious diseases or disorder of the body that affect the respiratory system. (Prerequisites: 10-515-170, Respiratory Therapy Survey; 10-806-177, General Anatomy & Physiology)

### **10-515-177 RESPIRATORY LIFE SUPPORT TECHNOLOGY**

...focuses on adult respiratory critical care including management of mechanical ventilation and artificial airways. (Prerequisites: 10-515-172, Respiratory Therapeutics 2; 10-515-174, Respiratory & Circulatory Physiology; 10-515-175, Respiratory Therapy Clinical 1)

### **10-515-178 RESPIRATORY THERAPY CLINICAL PRACTICE 2**

...continued development of Respiratory Therapy clinical skills including respiratory therapeutics. Focuses on monitoring, analyzing and interpreting data to make appropriate modifications in patient care. This course includes the complete program competency list. At the completion of this clinical learners must demonstrate competence in a minimum of 12 (required and/or simulated) competencies. (Prerequisite: 10-515-175, Respiratory Therapy Clinical 1)

### **10-515-179 RESPIRATORY THERAPY CLINICAL PRACTICE 3**

...continued development of Respiratory Therapy clinical skills including respiratory therapeutics. Focuses on monitoring, analyzing and interpreting data to make appropriate modifications in patient care. This course includes the complete program competency list. At the completion of this clinical learners must demonstrate competence in a minimum of 19 (required and/or simulated) competencies. (Corequisite: 10-515-178, Respiratory Therapy Clinical 2)

### **10-515-180 RESPIRATORY NEONATAL/PEDIATRIC CARE**

...provides a comprehensive orientation to the field of neonatal and pediatric respiratory care to include fetal development, birth, neonatal physiology, pulmonary dynamics, abnormal cardiopulmonary conditions, diseases, noninvasive and invasive therapeutic interventions. (Prerequisite: 10-515-177, Respiratory Life Support Technology)

### **10-515-181 RESPIRATORY & CIRCULATORY DIAGNOSTICS & MONITORING**

...advanced invasive and noninvasive diagnostic cardiopulmonary procedures including pulmonary function, hemodynamics and rescue medicine. (Prerequisites: 10-515-173, Respiratory Pharmacology; 10-515-176, Respiratory Disease; 10-515-177, Respiratory Life Support Technology)

### **10-515-182 RESPIRATORY THERAPY CLINICAL PRACTICE 4**

...continued development of Respiratory Therapy clinical skills including respiratory therapeutics. Focuses on monitoring, analyzing and interpreting data to make appropriate modifications in patient care. This course includes the complete program competency list. At the completion of this clinical learners must demonstrate competence in a minimum of 26 (required and/or simulated) competencies. (Prerequisite: 10-515-179, Respiratory Therapy Clinical 3)

### **10-515-183 RESPIRATORY THERAPY CLINICAL PRACTICE 5**

...focuses on the completion of respiratory therapy competencies and transition to employment. This course includes the complete program competency list. At the completion of this clinical learners must demonstrate competence in all of the (required and required/simulated) competencies. (Corequisite: 10-515-182, Respiratory Therapy Clinical 4)



# Supply Chain Management

Program Code 101821

## Associate Degree

Offered at the Green Bay campus. Most first year program courses available at Sturgeon Bay campus.

For information in Green Bay: (920) 498-5444. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Supply Chain Management prepares students in all activities involved in the flow of goods from the point of origin to the point of consumption. Specific areas include transportation, inventory control, materials management, operations management, purchasing, international trade, customer service, and logistics management.

### Program Outcomes

- Compare transportation modes and make decisions that will reflect savings for a company on fuel and oil price changes.
- Plan a product using a manufacturing resource planning process using enterprise resource planning (ERP) best practices.
- Provide cost-effective requests for transportation services.
- Develop a global supply chain management perspective.
- Apply legal and ethical standards.
- Monitor customer service, quality, and cost performance.
- Demonstrate knowledge of the application of supply chain management concepts.
- Review and interpret importing and exporting documents and commercial transportation documents for a global supply chain shipment.
- Understand e-business and logistics and fulfillment with b2b and b2c partners.
- Provide environment sustainability analysis for a role within a supply chain.
- Incorporate marketing and financial instruments to describe payment terms with global financial transactions.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Ability to use computer keyboard.
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Buyer/Planner:** coordinates activities between purchasing and manufacturing scheduling.

**Claims Analyst:** performs duties in the risk management process including over, short, and damage incidents and claims.

**Customer Service Representative:** communicates with customers in order to match customer needs with vehicle and driver availability, deals with customer inquiries, expedites freight, and tracks orders.

**Dispatcher:** assigns freight to routes, assigns vehicles and routes to drivers, and handles exceptions.

**Inventory Analyst:** compiles and manages information of amount, kind, and value of merchandise, material, or stock on hand to obtain optimum inventory balance, price, and costs.

**Inventory Control Specialist:** coordinates inventory issues with purchasing, production, and marketing; tracks current and forecasted levels of inbound and finished goods inventory.

**Logistics Technician:** communicates effectively with carriers and customers in 3PL environment, manages trailer needs, provides carrier assignments, monitors and traces customer shipments, and participates in carrier evaluation process.

**Materials Planner:** coordinates and expedites flow of manufacturing materials, parts, and assemblies with or between departments or plants in accordance with production and shipping schedules.

**Master Production Scheduler:** creates master production schedule and work orders; establishes priorities for current and forecasted customer demand; establishes availability or capacity of workers, parts, machinery, and equipment.

**Purchasing Assistant:** performs basic activities related to supplier evaluation and selection, product specifications, order quantities, and delivery requirements.

**Shipping and Receiving Specialist:** coordinates the flow of raw materials and finished goods to meet production and customer requirements and works with transportation carriers to assure timely and accurate pickup and delivery.

**Transportation Planner/Coordinator:** interfaces with customers and carriers in resolving pricing and delivery issues in 3PL environment, optimizes order consolidation and carrier selection considering cost, lead time, carrier capacity, and warehouse space constraints.

**Warehouse Specialist:** manages the flow of inventory into and out of a storage facility or distribution center, and works with owners of the inventory to meet inventory level and customer service needs.

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

- Account Manager
- Logistics Manager
- Materials Manager
- Production and Inventory Control Manager
- Purchasing Manager
- Traffic Manager

### Curriculum

The Supply Chain Management Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 67 credits.

#### First Semester

Catalog No.	Description	Credits
10-103-121	Micro: Word-Intro	1
10-103-131	Micro: Excel-Intro	1
10-103-141	Micro: Access-Intro	1
10-103-151	Micro: PowerPoint-Intro	1
10-104-110	Marketing Principles	3
OR		
10-104-148	Global Marketing	3
10-182-110	Lean Operations Mgmt	3
10-182-157	Logistics/Supply Chain Mgmt	3
10-804-123	Math w Business Apps	3
<b>Semester Total</b>		<b>16</b>

#### Second Semester

10-101-106	Accounting-for Non-Accountants	3
OR		
10-101-184	Business Finance/Budgeting	3
10-102-160	Global Business Mgmt	3
10-104-191	Customer Service Mgmt	3
10-182-127	Purchasing	3
10-182-190	Transportation Mgmt	3
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>18</b>

#### Third Semester

10-182-160	Global Supply Chain Mgmt	3
10-801-196	Oral/Interpersonal Comm	3
10-809-166	Intro to Ethics: Theory & App	3
10-809-172	Race Ethnic & Diversity	3
10-809-195	Economics	3
10-809-199	Psychology Of Human Relations	3
<b>Semester Total</b>		<b>18</b>

#### Fourth Semester

10-102-104	International Business Prac	3
10-182-120	Enterprise Resource Plan/Cont	3
10-182-130	E-Business Logistics/Fulfill	3
10-182-141	Supply Chain Mgmt Internship	3
OR		
10-182-142	Supply Chain Mgmt Field Study	3
Elective		3
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>67</b>

#### Suggested Electives:

Negotiations, 10-182-131  
Team Building/Problem Solving, 10-196-189

This program is fully eligible for financial aid.

## 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](http://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.*

**10-101-106 ACCOUNTING: INTRO FOR NON-ACCOUNTANTS** ...teaching non-accountants to read, analyze, and interpret financial information for making informed business decisions. This class de-emphasizes the use of debits, credits, journal entries and other accounting procedures.

**10-101-184 BUSINESS FINANCE/BUDGETING** ...fiscal and monetary aspects of business. Each learner will demonstrate application of business types, cycles, forecasting, budgeting, expense control, and financial statement interpretation relevant to the supervisor as a non-accountant.

**10-102-104 INTERNATIONAL BUSINESS PRACTICE FIRM...** (IBPF) is a group of virtual businesses at colleges around the world. Learners will staff the virtual business at NWTc. Students will start up their own business and sell and buy products in a virtual classroom environment. Each student will play the role of a manager.

**10-102-160 GLOBAL BUSINESS MANAGEMENT** ...globalization, cultural environment, global trade environment, politics and law, economic integration, global trade and investment theories, exporting, global marketing, and global supply chain.

**10-103-121 MICRO: WORD-INTRODUCTION** ...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience.

**10-103-131 MICRO: EXCEL-INTRODUCTION** ...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience.

**10-103-141 MICRO: ACCESS-INTRODUCTION** ...creating and modifying database tables, compacting a database, managing records, defining table relationships, creating queries, calculations, and aggregate functions, sorting, and using form and report wizards. Requires Windows experience.

**10-103-151 MICRO: POWERPOINT-INTRODUCTION** ...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word experience.

**10-104-110 MARKETING PRINCIPLES** ...marketing management, market segmentation, market research, consumer behavior, product decisions and management of distribution, pricing, promotional decisions for strategy planning.

**10-104-148 GLOBAL MARKETING** ...tools necessary for the student to understand the risks, rewards, and the technical aspects of doing business in a global environment.

**10-104-191 CUSTOMER SERVICE MANAGEMENT** ...develop professional telephone etiquette, explore customer service work environments, identify and analyze customer service failures, resolve problems cost effectively, set complaint policies, and develop communication techniques to handle complaining customers.

**10-182-110 LEAN OPERATIONS MANAGEMENT** ...lean operating concepts, total quality management, six sigma methodologies, continuous improvement tools/techniques, process mapping, 5S principles, statistical process control/pull signals, cellular manufacturing, mixed-model production, human resource development.

**10-182-120 ENTERPRISE RESOURCE PLAN/CONTROL** ...enterprise resource planning (ERP), benefits of ERP implementation in an organization, business process alignment, value chain process, technology and international considerations, successful change management, and ERP project management.

**10-182-127 PURCHASING** ...role of purchasing in business, industry, and the community; legal and ethical aspects of purchasing including systems, staffing, price/cost analysis, contract administration, and dealing with vendors.

**10-182-130 E-BUSINESS LOGISTICS/FULFILLMENT** ...understanding of how Supply Chain Management is related to E-Commerce, E-Business distribution, E-Procurement, legal and ethical issues, and E-Business logistics applications.

**10-182-141 SUPPLY CHAIN MANAGEMENT INTERNSHIP** ...training and experience through work experience and observation.

**10-182-142 SUPPLY CHAIN MANAGEMENT FIELD STUDY** ...alternative to the internship: in-depth study of an industry, business, career or project.

**10-182-157 LOGISTICS/SUPPLY CHAIN MANAGEMENT** ...integrated logistics supply chain, dimensions of logistics and supply chain management, demand management and customer service, procurement and supply management, global logistics, inventory management, warehousing, transportation and third-party logistics.

**10-182-160 GLOBAL SUPPLY CHAIN MANAGEMENT** ...methods of foreign market entry, international contracts, INCOTERMS 2000, terms of payment, international commercial documents, international insurance, export packaging, customs clearance, and global supply chain logistics infrastructure.

**10-182-190 TRANSPORTATION MANAGEMENT** ...importance of transportation, transportation regulations/public policy, overview of transportation providers (motor carriers, railroads, air carriers, inter-modal and special carriers), costing/pricing transportation, transportation documentation, transportation management technology systems/processes.

# Surgical Technologist

Program Code 315121

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

The Surgical Technologist prepares and maintains a sterile field before and during surgery, passes instruments and supplies to the surgeon, provides safe patient care, and prepares instruments for operative procedures.

### Program Outcomes

- Apply health science principles to the peri-operative environment.
- Apply principles of disinfection and sterilization to the surgical environment, equipment, and instrumentation.
- Maintain principles of aseptic technique in the surgical environment.
- Prepare the operation room by gathering equipment and supplies.
- Pass instruments, equipment, and supplies.
- Provide a safe, efficient, and supportive environment for the peri-operative patient.
- Anticipate the sequence of events during surgical procedures.
- Prepare and manage medications and solutions.
- Function as an ethical, legal, and moral member of the healthcare team within the surgical technologist's scope of practice.

### Wisconsin Caregiver Law

NWTC is required to comply with the Wisconsin Caregiver Law (1997 WISCONSIN ACT 27). The completion of a caregiver background check includes the review of criminal records for convictions of serious crimes or a history of improper behavior. Students accepted into health programs must complete a background information form disclosing any acts, crimes, or convictions prior to program entry. The information provided in the background information form must be truthful and match any findings on the criminal record check. Students with a criminal history may be denied access to clinical placement at the discretion of the clinical site. Consequently, should a student have a history of convictions of serious crimes or a history of improper behaviors, NWTC cannot guarantee clinical placement, or guarantee graduation within typical program timing.

### Employment Potential

A graduate of this program will have the potential for employment in a hospital, out patient surgery, private practice, or clinical setting as a:

- Surgical Technologist
- Central Supply Technician
- Claims Approver
- Private Scrub Technologist

### Clinical Experience

Students will be required to purchase scrub suits, pay for liability insurance for each course, provide their own transportation to assigned sites, and cover any other expenses related to clinical experiences. Students may be expected to travel distances and participate in early morning clinicals.

### Accreditation

The Surgical Technologist Program is accredited by Commission on Accreditation of Allied Health Education Programs in collaboration with the Accreditation Review Committee on Education in Surgical Technology  
7108-C South Alton Way, Suite 150  
Englewood, CO 80112  
(303) 694-9262  
FAX (303) 689-0518

### Requirements for Program Admission

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- Academic Skills Assessment, ACT assessment taken within the last three years.

### Requirements for Program Entry

- Meet established Academic Skills Assessment program benchmarks or a minimum standard composite score of 14 on the ACT with acceptable scores in Reading, English and Math. Proof of remediation may be demonstrated by an Academic Skills Assessment post-test or completion of an approved course in the content requiring remediation.
- Attend mandatory program orientation.
- Complete physical examination within three months before entering the program and maintain current immunization information.
- Complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card to comply with affiliating agency requirements.
- Submit Caregiver Background Check paperwork.

### Curriculum

The Surgical Technologist Technical Diploma is a three-semester program. Upon graduation, a student will have completed 34 credits.

First semester courses can be taken prior to being admitted into the Surgical Technologist program.

#### First Semester

Catalog No.	Description	Credits
* 10-501-101	Medical Terminology	3
* 31-509-302	Human Body in Health & Disease	3
* 31-512-326	ST-Infection Control	1
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>9</b>

#### Second Semester

* 31-512-327	ST: Introduction	4
* 31-512-328	ST: Fundamentals 1	4
* 31-512-329	ST: Fundamentals 2	2
* 31-512-330	ST: Clinical 1	3
<b>Semester Total</b>		<b>13</b>

#### Third Semester

* 31-512-331	ST: Surgical Procedures	4
* 31-512-332	ST: Clinical 2	4
* 31-512-334	ST: Clinical 3	4
<b>Semester Total</b>		<b>12</b>
<b>Total Credits</b>		<b>34</b>

\* No final grade lower than a "C" is acceptable in any of the courses marked with an asterisk. A student who withdraws or receive a grade lower than a "C" in a program course may apply for re-entry into the program. Consideration for re-entry will be at the discretion of the re-entry team and will be dependent on clinical availability.

### Note

Prior to second semester coursework, students must complete 10-501-101, Medical Terminology; 31-509-302, Human Body in Health & Disease; and 31-512-326, ST: Infection Control.

This program is fully eligible for financial aid.



### 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](http://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.*

**10-501-101 MEDICAL TERMINOLOGY** ...focuses on the component parts of medical terms: Prefixes, suffixes, and root words. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

**31-512-326 ST: INFECTION CONTROL** ...covers the structure, general classification, reproduction and transmission of microorganisms. Emphasis will be placed on the practice of sterile technique and its impact on infection control in the health care setting.

**31-512-327 ST: INTRODUCTION** ...provides the foundational knowledge of disinfection, sterilization, infection control, and asepsis. Legal and ethical issues encountered in the healthcare environment are explored. Simulated laboratory practice enables the learner to develop beginning technical skills. (Prerequisites: 31-509-302, Human Body in Health & Disease; 10-501-101, Medical Terminology; Accepted into the Surgical Technologist Program; Corequisite: 31-512-326, ST: Infection Control)

**31-512-328 ST: FUNDAMENTALS 1** ...includes the basic clinical skills needed by the Surgical Technologist in the scrub role. Learners develop skills in identifying basic instrumentation, supplies, drains, catheters, dressings and sponges. Includes practice experience in creating a sterile field, draping, passing instruments and supplies, performing counts and preparing supplies. (Prerequisites: 31-509-302, Human Body in Health & Disease; 10-501-101, Medical Terminology; 31-512-326, ST: Infection Control )

**31-512-329 ST: FUNDAMENTALS 2** ...builds upon and reinforces the role of the Surgical Technologist as a member of the operating room team. Discusses care of the patient before, during and after surgery with emphasis on surgical wounds, wound closure material, and vital signs. Includes lecture and lab experiences. (Corequisites: 31-512-327, ST: Introduction; 31-512-328, ST: Fundamentals 1)

**31-512-330 ST: CLINICAL 1** ...apply basic surgical theories, principles, and procedural techniques in the operating room. Students begin to function as team members under the guidance of the instructor and authorized clinical personnel. (Corequisites: 31-512-327, ST: Intro to Surg Tech; 31-512-328, ST: Fundamentals 1)

**31-512-331 ST: SURGICAL PROCEDURES** ...provides the foundational knowledge of surgical core and specialty procedures. Examines pathophysiology, diagnostic interventions, and surgical interventions for a variety of surgical procedures. Incorporates integration of basic health sciences and technical knowledge to complete a plan of action for a surgical procedure. (Prerequisites: 31-512-329, ST: Fundamentals 2; 31-512-330, ST: Clinical 1)

**31-512-332 ST: CLINICAL 2** ...further experience in a clinical setting allows the student to continue to improve technical skills while accepting more responsibilities during surgical procedures. (Prerequisites: 31-512329, ST: Fundamentals 2; 31-512-330, ST: Clinical 1; Corequisite: 31-512-331, ST: Surgical Procedures)

**31-512-334 ST: CLINICAL 3** ...enhances the student's technical experience and employee skills. Serves as a transition between student and employee. Application of advanced skills for the entry-level surgical technologist in the clinical setting. (Corequisites: 31-512-332, ST: Clinical 2; 31-512-331, ST: Surgical Procedures)

# Utilities Engineering Technology

Program Code 104681

## Associate Degree

(Program Pending State Approval June 2009)

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Utilities Engineering Technology prepares students for employment as utility system engineering technicians, designers, coordinators, planners, construction supervisors, project managers, estimators and equipment maintenance technicians, substation test (relay) technicians, in the utility industry from power generation through transmission and distribution.

### Program Outcomes

- Identify and apply the necessary safety procedures required to work safely in the electrical and gas utility industry.
- Acquire an understanding of the utility industry from generation through distribution.
- Perform standard testing of electrical distribution equipment.
- Plan, manage and implement utility projects.
- Explore the overall operation and control of utility generation and distribution equipment.
- Conduct non-destructive and predictive testing of electrical distribution equipment.
- Examine and apply knowledge of gas, electricity, electronics, hydraulics, electric motors and mechanical systems.
- Draw and read technical schematics and diagrams.
- Document technical information through descriptive writing, sketches/diagrams, mathematical expression, computation, and graphs.
- Construct ladder diagrams, flow charts, timing diagrams and basic computer control algorithms for machine control.
- Perform electrical/mechanical assembly/disassembly, repair, and calibrate components by selecting tools and equipment and following procedures.
- Implement the basic fastening skills related to machine fabrication and assembly requirements.
- Apply electrical skills to troubleshoot control and operator panels.
- Apply gas diagnostic tools to troubleshoot and resolve system problems.
- Apply programming languages to the control of single programmable controllers and industrial networks.
- Apply computer hardware/software applications to utility systems for design and coordination.
- Apply critical thinking skills to solving problems.
- Effectively communicate and perform in a team environment.

### Employment Potential

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

**Systems Control & Relay Technician:** installs, tests, adjusts, calibrates, repairs, and troubleshoots electrical power systems protective relays, controls, alarms, metering, remote control and telemetering equipment. Coordinates the installation and modification of protective relays with engineers.

**Substation Technician:** installs, tests, adjusts and repairs power transformers, loads tap changers, potential transformers, current transformers, high voltage switchgears, battery and charger systems and control equipment used in substations. Evaluates transformer oil analysis and conducts high-potential tests, Doble tests, primary injections, breaker trip tests, contact resistances tests, etc.

**Distribution Systems Designer:** designs systems for construction and maintenance of natural gas and electric systems. Develops construction plans; prepares cost estimates, creates material requirements, processes work requests and prepares documents.

**Power Plant Instrument Technician:** analyzes and repairs electrical and instrument/controls hardware and software in a power generation plant. Troubleshoots, maintains, and repairs generator excitation systems, synchronization systems, and voltage regulators.

**Relay Technologist:** ensures safe and effective operation of transmissions, distribution and generation facilities by calibrating, testing, maintaining and repairing protective and auxiliary relays, relay systems and associated communication equipment.

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

- Utilities Construction Project Manager
- Power Plant Maintenance Supervisor
- Substation Design Supervisor
- Substation Preventive Maintenance Supervisor
- Electro-Mechanical Technician
- Electronics Technician
- Field Service Technician

### Requirements for Program Entry

- Completed application.
- High school transcript or equivalent (such as an HSED or GED® Transcript).
- Students will be required to take the Accuplacer College Level Math assessment. The benchmark grade for Utilities Engineering Technician on the College Math assessment is 50.
- Courses require mastery of algebra skills. For a description of algebra skills, see the Basic Education section of this catalog.

### Curriculum

The Utilities Engineering Technology Associate Degree is a two-year, four-semester program.

Upon graduation, a student will have completed 68 credits.

#### First Semester

Catalog No.	Description	Credits
10-614-113	2D Essentials	2
10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
10-660-101	Digital 1: Logic	1
10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-660-106	DC 3: Circuit Theorems	1
10-664-100	Automation 1: Control Logic	1
10-664-101	Automation 2: Motor Control	1
10-804-118	Interm Algebra w Apps	4
10-809-198	Intro to Psychology	3
<b>Semester Total</b>		<b>17</b>

#### Second Semester

10-442-100	Metal Fabrication 1	2
10-468-100	Utility Safety	2
10-660-102	Digital 2: Sequential	1
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-110	Electronics 1: Diodes-Basic	1
10-664-102	Automation 3: PLC	1
10-664-103	Automation 4: PLC	1
10-664-104	Automation 5: PLC	1
10-804-196	Trigonometry w Apps	3
10-806-143	College Physics 1	3
<b>Semester Total</b>		<b>17</b>

#### Third Semester

10-468-101	Utility Power Systems Coord	3
10-468-105	Utility Generation Systems	2
10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Drives	1
10-620-159	Power Electronics 3: Drives	1
10-620-161	Power Electricity 1: Motors	1
10-620-162	Power Electricity 2: Motors	1
10-660-109	AC 3: RLC Circuits	1
10-664-160	Control 1: Discrete Systems	1
10-664-161	Control 2: Process Systems	1
10-664-162	Control 3: Motion Systems	1
10-801-195	Written Communication	3
<b>Semester Total</b>		<b>17</b>

#### Fourth Semester

10-468-102	Utility Project Execution	3
10-468-103	Utility Systems Maintenance	3
10-468-104	Utility Systems-Natural Gas	3
10-606-113	CAD	2
10-801-197	Technical Reporting	3
10-809-172	Race Ethnic & Diversity	3
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>68</b>

This program is fully eligible for financial aid.

## 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](http://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.*

**10-442-100 METAL FABRICATION 1** ...safety and introduction to basic metal fabrication tools and equipment utilizing precision measuring tools, geometric nomenclature, basic layout and assembly skills along with polygon construction, and triangulation from scale drawings. (Prerequisite: 10-614-113, 2D Essentials)

**10-468-100 UTILITY SAFETY** ...learn utility system safety terminology, definitions and practices. Define safety responsibility, vehicle laws, rules and regulations. Identify substation components; demonstrate safe work procedures on a simulated energized system using testing tools. (Prerequisite: 10-660-106 DC 3: Circuit Theorems; Corequisites: 10-660-107, AC 1 Properties; 10-660-108, AC 2 Reactance)

**10-468-101 UTILITY POWER SYSTEMS COORDINATION** ...learn utility systems interconnection from generation through distribution. Includes: powerhouse, hydroelectric, wind, solar and nuclear, EHV and HV transmission, the utility grid, device coordination, metering, protective relays, fuses, breakers, and fault current interrupting. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-605-157, Power Electronics 1: Devices; 10-605-158, Power Electronics 2: Drives; 10-605-159, Power Electronics 3: Drives)

**10-468-102 UTILITY PROJECT EXECUTION** ...develop the utility project management skills necessary to manage and execute a construction project from concept through commissioning. Learn project utility planning, design and execution skills with hands-on methods and real world applications. (Prerequisite: 10-468-101, Utility Power Systems Coordination)

**10-468-103 UTILITY SYSTEMS MAINTENANCE** ...learn utility systems testing methods and hands-on experience with the tools necessary to provide preventive and predictive maintenance services for electrical distribution equipment. Utilize standard utility testing tools, non-destructive testing tools and predictive failure analysis methods. (Prerequisite: 10-468-101, Utility Power Systems Coordination)

**10-468-104 UTILITY SYSTEMS-NATURAL GAS** ...learn natural gas utility systems configuration from supply sources to local distribution and customer loads. Train on basic gas utility field installation and service practices. (Prerequisites: 10-468-101, Utility Power Systems Coordination; 10-442-100, Metal Fabrication 1)

**10-468-105 UTILITY GENERATION SYSTEMS** ...learn utility generation systems types, configuration and basic operation and maintenance of generation systems. Includes: powerhouse, gas turbine, hydroelectric, wind, solar and nuclear. Emphasis of coal fired generation systems. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-605-157, Power Electronics 1: Devices; 10-605-158, Power Electronics 2: Drives; 10-605-159, Power Electronics 3: Drives)

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics and applications of thyristors, power transistors, and switching devices. (Prerequisite: 10-660-107, AC 1: Properties)

**10-605-158 POWER ELECTRONICS 2: DRIVES** ...power circuitry of AC and DC drives and basic setup and application of an industrial DC and AC drives to DC and AC motors. (Corequisite: 10-605-157, Power Electronics 1: Devices)

**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. (Corequisite: 10-607-119, Civil Drafting Technology OR 10-606-119, Technical Sketching OR 10-614-113, 2D Essentials)

**10-614-113 2D ESSENTIALS** ...an introduction to technical communication, annotation, geometric construction, model, orthographic and pictorial, section and auxiliary views and dimensioning. Knowledge integral to Model Building.

**10-620-100 FLUIDS 1: BASIC PNEUMATICS** ...what fluid power is, differentiate between hydraulics and pneumatics, implement basic pneumatic circuits, utilize schematics, apply Pascal's law, define properties of fluids, implement airflow control and hydraulics cylinder circuits.

**10-620-101 FLUIDS 2: BASIC HYDRAULICS** ...hydraulic pumps, basic hydraulics actuator circuits, hydraulic schematics, apply Pascal's Law, summarize the effects of fluids friction, define properties of hydraulic energy, design hydraulic circuits with directional control valves. (Corequisite: 10-620-100, Fluids 1: Basic Pneumatics)

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC drives and application of industrial AC drives to AC motors. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ...DC motors and generator configuration, shunt, compound, and permanent magnet DC motor performance and characteristics.

**10-620-162 POWER ELECTRICITY 2: MOTORS** ...series DC, Compound DC, AC Induction, and Specialty machine performance and characteristics, and three-phase power systems. (Corequisite: 10-620-161, Power Electricity 1: Motors)

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operation using switch logic, ladder logic, and gate logic. Simplification methods using Boolean theorems and Karnaugh Maps, and timing diagram analysis.

**10-660-102 DIGITAL 2: SEQUENTIAL** ...operation and connection of Latches, RS flip-flops, JK flip-flops, and D flip-flops using timing diagram analysis, and some simple applications are studied. (Prerequisite: 10-660-101, Digital 1: Logic)

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, Current, Resistance, Ohm's Law, Power and Kirchoff's Voltage Law are defined.

**10-660-105 DC 2: CIRCUITS** ...analysis of parallel and series-parallel circuits. Application of Kirchoff's Current Law to parallel circuit combinations. Introduction of current sources and source conversions. (Corequisites: 10-804-118, Interim Algebra w Apps OR equivalent; 10-660-104, DC 1: Intro)

**10-660-106 DC 3: CIRCUIT THEOREMS** ...analysis of circuits using various advanced methods. Branch, loop and node methods are studied. Eight network theorems are presented for the solution of circuit voltages and circuits. (Prerequisite: 10-660-105, DC 2: Circuits)

**10-660-107 AC 1: PROPERTIES** ...introduction to the properties of Capacitors and Inductors including types and behavior in switching circuits. Inductor basics include a study of magnetic fields. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-804-196, Trigonometry w Apps.)

**10-660-108 AC 2: REACTANCE** ...study of the way inductive, capacitive and resistive components behave in a circuit excited by a sine waveform. Effective and average values of the sinewave are derived. (Corequisite: 10-660-107, AC 1: Properties)

**10-660-109 AC 3: RLC CIRCUITS** ...power flow in complex AC circuits based on resistive and reactive components. Description of the power triangle and power factor. Calculation of voltages and currents in complex AC circuits. (Prerequisite: 10-660-108, AC 2: Reactance)

**10-660-110 ELECTRONICS 1: DIODES-BASIC** ...introduction to the characteristics and usage of semiconductor diodes in rectifiers and linear power supplies. Special diodes and diode circuits are also considered. (Prerequisite: 10-660-105, DC 2: Circuits; Corequisite: 10-660-107, AC 1: Properties;)

**10-664-100 AUTOMATION 1: CONTROL LOGIC** ...electric motor control components such as switches, relays, starters, transformers, and safely mount and install motor and motor control components and perform related wiring and troubleshooting of motor control circuits.

**10-664-101 AUTOMATION 2: MOTOR CONTROL** ...electric motor control components such as sensors, timers and counters. (Corequisite: 10-664-100, Automation 1: Control Logic)

**10-664-102 AUTOMATION 3: PLC** ...basic programmable logic controller programming and troubleshooting.

**10-664-103 AUTOMATION 4: PLC** ...troubleshooting a PLC System, applying Event Sequencing, developing PLC applications, applying timer instructions and counter instructions. (Corequisite: 10-664-102, Automation 3: PLC)

**10-664-104 AUTOMATION 5: PLC** ...application, troubleshooting, and implementation of program control, math and data move instructions, analog I/O modules, and producing a PLC program from specification. (Corequisite: 10-664-103, Automation 4: PLC)

**10-664-160 CONTROL 1: DISCRETE SYSTEMS** ...applications and utilization of motion feedback devices, force measurement devices, temperature sensors, and fluid measurement devices. (Prerequisite: 10-660-110, Electronics 1: Diodes Basic)

**10-664-161 CONTROL 2: PROCESS SYSTEMS** ...Open-Loop versus Closed-Loop systems, industrial control systems, two-position control and its applications, PID control and its applications, and relationship between process response and proper mode of control. (Corequisite: 10-664-160, Control 1: Discrete Systems)

**10-664-162 CONTROL 3: MOTION SYSTEMS** ...hydraulic and pneumatic proportional/servo valves, servo motors, configuration and programming of an analog motion control system. (Corequisite: 10-664-161, Control 2: Process Systems)



# Welding

Program Code 314421

## Technical Diploma

Offered at the Green Bay, Marinette and Sturgeon Bay campuses. For information in Green Bay: (920) 498-5444.

For information in Marinette: (715) 735-9361. For information in Sturgeon Bay: (920) 746-4900. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Welding prepares students to join metal by applying heat and pressure to join metal sections together to form a permanent bond. Welders plan layouts or work from blueprints, drawings, or other specifications.

### Program Outcomes

- Be successfully employed in the welding industry.
- Perform procedures using plasma, carbon arc, oxyacetylene processes.
- Perform procedures using the Shielded Metal Arc Welding process (S.M.A.W).
- Perform procedures using the Gas Metal Arc Welding process (G.M.A.W).
- Perform procedures using the Gas Tungsten Arc Welding process (G.T.A.W).
- Perform procedures using the Flux Core Arc Welding process (F.C.A.W).
- Perform procedures using the Submerged Arc Welding process (S.A.W).
- Perform welding procedures using the Metal Core process.
- Interpret mechanical drawings.
- Fabricate projects from blueprints and sketches.
- Perform basic mathematical computations.
- Identify various ferrous and non-ferrous materials.
- Communicate with co-workers and supervisors.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

A graduate of the program will have the potential for employment as a Maintenance Welder, Qualified Welder, Structural Welder, Welder/Fabricator, and Pipe Welder. In these jobs, the graduate will build and repair metal components using basic knowledge of blueprints, metallurgy, and layout while applying the major welding processes used by industry; and will be trained in code welding according to the AWS (American Welding Society) and ASME (American Society of Mechanical Engineers) with testing provided on campus. Other positions might include Construction Trades Welder, Ironworker Trades Welder, Millwright, Sheetmetal Trades Welder, and Pipe Trades Welder. People in many apprenticeship programs are required to take welding classes as part of their training.

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

- Journeylevel Welder
- Welding Inspector
- Welding Supervisor
- Journeylevel Welder/Fabricator

### Certification:

All NWTC Welding program instructors are certified welders.

### Curriculum

The Welding Technical Diploma is a one-year, two-semester program. Upon graduation, students will have completed 36 credits.

#### First Semester

Catalog No.	Description	Credits
10-804-106	Intro to College Math	3
31-421-331	Blueprint Reading I	3
31-442-301	Welding-Cutting/Visual	1
31-442-316	Welding-Shielded Metal Arc	5
31-442-317	Welding-Gas Metal Arc	5
31-442-332	Metal Fabrication I	2
<b>Semester Total</b>		<b>19</b>

#### Second Semester

31-421-333	Blueprint Reading II	2
31-422-310	Metallurgy	2
31-442-321	Welding-Gas Tungsten Arc	5
31-442-327	Welding-Flux Core	5
31-442-334	Metal Fabrication II	2
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>17</b>
<b>Total Credits</b>		<b>36</b>

This program is fully eligible for financial aid.

### 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](http://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.*

**31-421-331 BLUEPRINT READING I** ... Orthographic projection, sketching, dimensioning, section and auxiliary views, structural shapes, welding symbols, weld joint nomenclature, welding joint geometry, metric conversion and interpretation of fabrications from prints.

**31-421-333 BLUEPRINT READING II** ...Develop advanced blueprint reading skills to read and interpret moderate to advanced blueprints and shop drawings. (Prerequisite: 31-421-331, Blueprint Reading I).

**31-422-310 METALLURGY** ...manufacture of iron and steel, mechanical and physical properties of metals, metal identification, macro and microscopic grain structures, welding metallurgy, applied heat treating processes, and weld failures and fractures.

**31-442-301 WELDING-CUTTING/VISUAL** ...visual inspection of weld and cut edges, manual and machine oxy fuel gas cutting, air carbon arc cutting, plasma arc cutting, and mechanical cutting methods.

**31-442-316 WELDING-SHIELDED METAL ARC** ...safety, SMAW equipment, materials, accessories, inspection, weld types, joints, and position. (Corequisite: 31-442-301, Welding-Cutting/Visual)

**31-442-317 WELDING-GAS METAL ARC (GMAW)** ...welding safety, GMAW equipment/set up, joint details and distortion control, GMAW weld faults, welding metallurgy, and weld symbol interpretation. (Corequisite: 31-442-301, Welding-Cutting/Visual)

**31-442-321 WELDING-GAS TUNGSTEN ARC** ...perform gas tungsten arc welding (GTAW) in all positions, on plain carbon steel, aluminum, and 3XX stainless steel. (Corequisite: 31-442-301, Welding-Cutting/Visual)



**31-442-327 WELDING-FLUX CORE** ...safety, equipment, accessories, inspection and repairs, weld types and joint nomenclature, surface welds and all position fillet and groove welds. (Corequisite: 31-442-301, Welding-Cutting/Visual)

**31-442-332 METAL FABRICATION I** ...Safety and introduction to basic metal fabrication tools and equipment utilizing precision measuring tools, geometric nomenclature, basic layout and assembly skills along with polygon construction, and triangulation from scale drawings.

**31-442-334 METAL FABRICATION II** ...Advanced metal fabrication tools developing assembly and sub-assemblies from working prints using various fabrication processes. Additionally, rigging and lifting, distortion control, and basic CNC programming will be incorporated. (Prerequisite: 31-442-332, Metal Fabrication I)

# Wood Tech

Program Code 314102

## Technical Diploma

Offered at the Green Bay campus.

For information: (920) 498-5444. Toll-free: (800) 422-NWTC, ext. 5444.

### Program Description

Wood Tech prepares students to enter the building construction trades as carpenters and cabinetmakers.

### Program Outcomes

- Use materials according to application.
- Adhere to safety standards.
- Use industry terminology.
- Use measuring systems in the industry.
- Visualize final products from blueprints.
- Estimate labor and material costs.
- Erect building and cabinet modules.
- Apply wood finishing.

### Requirements for Program Entry

- Completed application.
- High school transcript, HSED transcript, or General Education Development® (GED) Tests transcript.
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### Employment Potential

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

**Carpenter/Cabinetmaker:** builds cabinets; is capable in layout, frame, fabrication, assembly, and finish preparation; applies laminated plastic; and installs drawers and door hardware.

**Carpenter/Finish:** applies interior wall covering and paneling, hangs doors, applies trim, and installs and adjusts cabinets and built-in furniture.

**Carpenter/General Builder:** works in all areas of building construction; installs interior and exterior finish surface materials, interior floor and ceiling specialties, rough framing, building layout, stair construction, and interior trim and cabinetry.

**Carpenter/Millworker:** works in a factory setting; mass produces trim, cabinets, and furniture; custom planes and saws; and handles other operations that demand the use of large and specialized machinery.

**Carpenter/Rough:** erects forms for concrete foundations, rough framing, and roofing for residential and commercial construction; erects scaffolding; installs sheathing, siding, and prepares site for jobs.

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

- Contractor
- Carpenter Apprentice
- Carpenter Journeyman
- Mill Supervisor
- Journeyman Cabinet Maker
- Construction Retail Materials Sales
- Construction Wholesale Material Sales
- Specialty Products Sales for Roofing, Trusses, Windows & Doors
- Estimating Technician
- Commercial Finisher
- Expediter

### Curriculum

The Wood Tech Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 34 credits.

#### First Semester

Catalog No.	Description	Credits
* 10-804-106	Intro to College Math	3
31-403-350	Blueprint Rdg-Construction	2
31-410-301	Wood Tech-Bldg Matl Est	2
31-410-311	Wood Techniques-Carpentry 1	5
31-410-312	Wood Techniques-Carpentry 2	5
31-806-354	Science-Wood Tech	2
<b>Semester Total</b>		<b>19</b>

#### Second Semester

31-403-360	Blueprint Rdg-Cabinetry	2
31-409-310	Commercial Cabinet Finishes	1
31-409-321	Wood Techniques-Cabinetry 1	5
31-409-322	Wood Techniques-Cabinetry 2	5
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
<b>Semester Total</b>		<b>15</b>
<b>Total Credits</b>		<b>34</b>

\* Intro to College Math (10-804-106) must be taken during the student's first semester at NWTC.

This program is fully eligible for financial aid.



### 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](http://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.*

#### 31-403-350 BLUEPRINT READING CONSTRUCTION

...drawing development/equipment, blueprints, plot and building layout, scaling and dimensioning practices, symbols, notations, basement/floor elevations, detail/sectional drawings, residential/industrial print reading, and schedules and specifications.

#### 31-403-360 BLUEPRINT READING-CABINETRY

...sectional detail, cabinet layout, blueprint reading, angle layout, and countertop layout.

#### 31-409-310 COMMERCIAL CABINET FINISHES

...personal protection and safety, abrasives, finishing materials, spray equipment, spray applications and troubleshooting.

#### 31-409-321 WOOD TECHNIQUES-CABINETRY 1

...size and cut frame members for doweling, mortise and tenon, pocket drilling, calculate panel sizes and supports, assemble cabinet both upper & lower.

#### 31-409-322 WOOD TECHNIQUES-CABINETRY 2

...identify by and butt unit both upper and lower, size stiles rails panels, setup and cut dovetail joints, size cut and assemble drawer, cut and apply plastic. (Corequisite: 31-409-321, Wood Techniques-Cabinetry 1)

#### 31-410-301 WOOD TECHNIQUES-BUILDING MATERIAL

**ESTIMATES** ...perform material and labor cost estimates of building foundations, floor systems, superstructures, and exterior and interior finish systems.

**31-410-311 WOOD TECHNIQUES-CARPENTRY 1** ...basics of tool and equipment safety, materials common to residential construction and proper application, framing theory of floor, wall, and roof systems.

#### 31-410-312 WOOD TECHNIQUES-CARPENTRY 2

...theory and practice of roof and stair calculations and construction, as well as exterior finish systems and door and window installation. (Corequisite: 31-410-311, Wood Techniques-Carpentry 1)

# Occupational Support and General Education

## Course Descriptions

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### Occupational Support

#### **10-103-111 MICRO: WINDOWS-INTRODUCTION**

...Windows desktop elements, help features, document management (create, open, save, print), folder and file management (create, delete, move, find file), Web features, search strategies, shortcuts, screen capture, My Computer/Explorer. 1 cr.

#### **10-103-121 MICRO: WORD-INTRODUCTION**

...word processing basics including creating, revising, formatting, and printing; sections, tabs, multiple-page numbering; manipulating text; creating headers/footers; creating and formatting tables, graphics, creating charts; applying styles; and merging documents. Requires Windows experience. 1 cr.

#### **10-103-131 MICRO: EXCEL-INTRODUCTION**

...creating a worksheet, enhancing worksheet appearance, moving and copying data, using formulas and functions, creating charts and using clip art. Requires Windows experience. 1 cr.

#### **10-103-151 MICRO: POWERPOINT-INTRODUCTION**

...presentation development skills such as: graphics, tables, diagrams, shapes, design themes, sounds, animations, slide transitions, and integration with other software. Requires Windows and MS Word

experience. 1 cr.

**10-104-125 EVENT MARKETING** ...planning, promotion execution, and evaluation of special events (entertainment, industry, meeting/convention). Students will work toward the actual staging of an event will require time outside of the classroom setting). 3 cr.

**10-196-191 SUPERVISION** ...front-line leadership including teamwork, setting goals, planning, delegation, controlling, communication, motivation, performance management, staffing, training, problem solving, and conflict management. 3 cr.

**31-413-359 ELECTRICAL INTERNSHIP** ...72 hours of work experience focused on gaining varied work experiences for Electricity students, maintaining acceptable attendance, adhering to policies and procedures, accepting responsibility, and working professionally. 1 cr.

**31-419-311 HYDRAULICS-APPLIED** ...hydraulic schematics, drive systems, hydraulic system diagnosis/troubleshooting, hydraulic circuits, piping, fluid mechanics, seals, packings, hydraulic component operation, and accumulators. 2 cr.

**30-428-337 POWER HOUSE-ECONOMICS** ...guide student in combining newly learned principles with available reference material to determine basic powerhouse economics. 1 cr.

**32-442-352 WELDING-METAL WORKING PROCESSES** ...welding and machine shop safety, blueprint reading, basic arc and oxyacetylene welding techniques, precision measuring tools, layout, use of hand tools, band saw, drillpress, lathe, milling machine. 2 cr.

**10-501-104 HEALTHCARE CUSTOMER SERV** ...is designed as an introduction to customer service for learners interested in working in various healthcare settings. The learner investigates healthcare systems, safety standards, and the workforce. The learner examines professionalism, interpersonal and written communication skills, and confidentiality as they relate to customer service in healthcare. 2 cr.

**10-501-107 INTRODUCTION TO HEALTHCARE COMPUTING** ...provides an introduction to basic computer functions and applications utilized in contemporary healthcare settings. Students are introduced to the hardware and software components of modern computer systems. 2 cr.

**31-509-302 HUMAN BODY IN HEALTH & DISEASE** ...students learn to recognize the causes, signs, and symptoms of diseases of the major body systems as well as the diagnostic procedures, usual treatment, prognosis and prevention of common diseases. 3 cr.

**10-664-164 CONTROL 5: SERVO SYSTEMS** ...motion control troubleshooting and fault recovery, advanced motion control programming, integration of motion control system and motion control network. (Prerequisite: 10-664-163, Control 4: Drive Performance) 1 cr.

### General Education

#### Communication

**10-801-136 ENGLISH COMPOSITION 1** ...learners develop knowledge/skills in planning, organizing, writing, editing. Students will also analyze audience/purpose, use elements of research, format documents using standard guidelines, and develop critical reading skills. 3 cr.

**10-801-195 WRITTEN COMMUNICATION** ...the nature and scope of academic and business writing. Develops writing skills which include pre-writing, drafting, revising, and editing. A variety of writing assignments are designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Also develops critical reading and thinking skills through the analysis of a variety of written documents. 3 cr.

**10-801-196 ORAL/INTERPERSONAL COMMUNICATION** ...the communication process, perception and self-concept, language, listening, nonverbal communication, interpersonal relationships, communication in groups and public communication; prepare and deliver an oral presentation. 3 cr.

**10-801-197 TECHNICAL REPORTING** ...principles of report writing and correspondence, proposals, feasibility reports, progress reports, investigation reports, evaluation reports, meeting reports, memos, and correspondence. (Prerequisite: 10-801-195, Written Communication) 3 cr.

**10-801-198 SPEECH** ...fundamentals of effective oral presentation to small and large groups: topic selection, audience analysis, methods of organization, research, structuring evidence and support, delivery techniques, and the listening process. 3 cr.

**31-801-385 COMMUNICATING-WRITING** ...writing techniques, memos, letters, descriptions, instructions, and the job-seeking process. 1 cr.

**31-801-386 COMMUNICATING EFFECTIVELY** ...interpersonal communication, including the function of interpersonal communication, listening techniques, perception, non-verbal communication, language, self-concept, conflict resolution and customer service. 1 cr.

# General Education

## Course Descriptions

### Mathematics

**10-804-106 INTRODUCTION TO COLLEGE MATH** ...an introductory level course designed to review and develop fundamental concepts of arithmetic, algebra, geometry, and statistics. Emphasis will be placed on computational skills and applications of rational numbers; problem solving skills with ratios, proportions, and percent; basic principles and application of algebra, geometry, graphing, and statistics; measurement skills in U.S. Customary and Metric Systems; and the use of calculators as a tool. (Prerequisite: Recommendation: Accuplacer Arithmetic Test = 65) 3 cr.

**10-804-110 ELEMENTARY ALGEBRA WITH APPLICATIONS** ...traditional algebra topics with applications. Learners develop algebraic problem solving techniques needed for technical problem solving and for more advanced algebraic studies. Topics include linear equations, exponents, polynomials, rational expressions, and roots and radicals. Successful completion of this course prepares learners to succeed in technical mathematics courses. (Prerequisite: Recommendation: Accuplacer Arithmetic Test = 65, OR Accuplacer Algebra Test = 33) 3 cr.

**10-804-118 INTERM ALGEBRA WITH APPLICATIONS** ...algebra content with applications. Topics include properties of real numbers, order of operations, algebraic solution for linear equations and inequalities, operations with polynomial and rational expressions, operations with rational exponents and radicals, algebra of inverse, logarithmic and exponential functions. (Prerequisites: Recommendation: Accuplacer Algebra Test = 61 OR Accuplacer (College Level Math) = 40 OR Completion of 10-804-110, Elementary Algebra w Apps OR 10-804-120, Math-Tech Algebra with grade "C" or better). 4 cr.

**10-804-123 MATH W BUSINESS APPS** ...real numbers; basic operations; proportions/one variable; percents, simple/compound interest; annuity; apply math concepts to purchasing/buying process, selling process; and basic statistics with business/consumer applications. (Prerequisite: Recommendation: Accuplacer Arithmetic = 65). 3 cr.

**10-804-133 MATH & LOGIC** ...students will apply mathematical problem solving techniques. Topics will include symbolic logic, sets, algebra, Boolean algebra, and number bases. (Prerequisite: Recommendation: Accuplacer Algebra Test = 61) 3 cr.

**10-804-195 COLLEGE ALGEBRA WITH APPLICATIONS** ...skills needed for success in Calculus and many application areas on a baccalaureate level. Topics include the real and complex number systems, polynomials, exponents, radicals, solving equations and inequalities (linear and nonlinear), relations and functions, systems of equations and inequalities (linear and nonlinear), matrices, graphing, conic sections, sequences and series, combinatorics, and the binomial theorem. (Prerequisites: Recommendation: Accuplacer (College Level Math) = 63 OR Completion of 10-804-118, Intermediate Algebra w Apps or 10-804-131, Math-Algebra/Inter with grade "C" or better) 3 cr.

**10-804-196 TRIGONOMETRY WITH APPLICATIONS** ...topics include circular functions, graphing of trigonometry functions, identities, equations, trigonometric functions of angles, inverse functions, solutions of triangles complex numbers, DeMoivre's Theorem, polar coordinates, and vectors. (Prerequisites: Recommendation: Accuplacer (College Level Math) = 63 OR Completion of 10-804-118, Intermediate Algebra w Apps; 10-804-195, College Algebra with Apps or 10-804-131, Math-Algebra/Inter with grade "C" or better OR Concurrent enrollment in 10-804-195, College Algebra with Apps) 3 cr.

**10-804-198 CALCULUS 1** ...analyze and graph algebraic expressions, especially conic sections. Develop an intuitive understanding of limits, derivatives and integrals. Apply the derivative and the integral to certain physical problems. (Prerequisites: Recommendation: Accuplacer (College Level Math) = 103 OR Completion of 10-804-195, College Algebra with Apps AND 10-804-196, Trigonometry with Apps, 10-804-197, College Algebra and Trigonometry with Apps or 10-804-132, Math-Geometry/Analytic with grade "C" or better) 4 cr.

**31-804-312 MATH-ALGEBRA/TRADES** ...signed numbers, order of operations, scientific notation, metric units/measurement, calculator operations, algebra, introductory trigonometry, Pythagorean theorem, solving right triangles. 1 cr.

### Natural Science

**10-806-134 GENERAL CHEMISTRY**...covers chemistry fundamentals. Topics: metric system, problem-solving, periodic relationships, chemical reactions, chemical equilibrium, properties of water; acids, bases, and salts; and gas laws. (Prerequisite: Recommendation: Completion of one year of High School Algebra with a "C" or better) 4 cr.

**10-806-143 COLLEGE PHYSICS 1** ...presents the applications and theory of basic physics principles. This course emphasizes problem solving, laboratory investigation and applications. Topics include laboratory safety, unit conversions and analysis, kinematics, dynamics, work, energy, power, temperature, and heat. (Prerequisite: Recommendation: 10-804-110, Elementary Algebra with Apps with a grade of "C" or better OR High School level Algebra with a grade of "C" or better) 3 cr.

**10-806-154 GENERAL PHYSICS 1** ...applications/theory of basic physics principles: problem-solving, laboratory investigation, and applications including unit conversion and analysis, vectors, translational and rotational kinematics/dynamics, heat/temperature, and harmonic motion and waves. (Prerequisite: Recommendation: 10-804-118, Intermediate Algebra with Apps with a grade of "C" or better) 4 cr.

**10-806-177 GENERAL ANATOMY & PHYSIOLOGY** ...overview of the human anatomy/physiology using a body-systems approach, emphasizing the interrelationships between form/function at the gross and microscopic levels. (Prerequisite: 10-806-134, General Chemistry OR 10-806-155, Chemistry-Basic OR High School Chemistry with a "C" or better OR College Chemistry transfer credit with a grade of "C" or better) 4 cr.

**10-806-179 ADVANCED ANATOMY & PHYSIOLOGY** ...normal human anatomy and physiology are studied using a body systems approach with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. (Prerequisite: 10-806-177, Gen Anatomy & Physiology, with a "C" or better) 4 cr.



# General Education

## Course Descriptions

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### **10-806-186 INTRODUCTION TO BIOCHEMISTRY**

...water/polarity, acids/bases, equilibrium, hydrocarbons, alcohols, amines, aldehydes/ ketones, carboxylic acids, proteins, enzymes/ vitamins, carbohydrates, lipids, energy, hormones, neurotransmitters/drugs, homeostasis, DNA/RNA, protein synthesis, and biotechnology. (Prerequisite: 10-806-134 General Chemistry OR 10-806-155, Chemistry-Basic, OR High School Chemistry with a "C" or better OR College Chemistry transfer credit with a grade of C or better.) 3 cr.

**10-806-189 BASIC ANATOMY** ...examines concepts of anatomy and physiology as they relate to health careers. Learners correlate anatomical and physiological terminology to all body systems. (Prerequisite: Recommendation: High School Chemistry or High School Biology with a "C" or better OR College Chemistry or College Biology or College General Anatomy transfer credit with a grade of "C" or better) 3 cr.

**10-806-197 MICROBIOLOGY** ...history, morphology, physiology, nutritional growth requirements, metabolism, methods of identification. Focus on disease-causing microorganisms, appropriate prevention, treatment, control mechanisms. Specific/non-specific host defense mechanisms, applications of immunology examined. (Prerequisite: 10-806-177, General Anatomy & Physiology, with a "C" or better.) 4 cr.

### **31-806-354 SCIENCE-WOOD TECHNICS**

...measurement systems, problem solving methods, properties of matter, forces, energy, work, power, simple machines, pressure, heat, electricity, and sound. 2 cr.

## **Social Science**

### **10-809-103 THINKING CRITICALLY & CREATIVELY**

...instruction in realistic/practical methods of thinking, including decision making, problem solving, analyzing ideas, troubleshooting, argumentation, persuasion, creativity, setting goals/objectives. Students apply strategies/tools in a variety of situations. 3 cr.

**10-809-159 ABNORMAL PSYCHOLOGY** ...surveys features, causes, assessment and treatment of abnormal behavior through major theoretical perspectives. Introduces the diagnosis system of the DSM-IV, the history, cultural/social differences, current perspectives, diagnosis criteria/treatments. (Prerequisite: Recommendation: Completion of 10-809-198 Introduction to Psychology) 3 cr.

**10-809-166 INTRO TO ETHICS: THEORY & APP** ...basic understanding of theoretical foundations of ethical thought; analyze/compare relevant issues using diverse ethical perspectives; critically evaluate individual, social/ professional standards of behavior-applying a systematic decision-making process. 3 cr.

**10-809-172 RACE ETHNIC & DIVERSITY** ...basic American values of justice and equality by teaching vocabulary, history of immigration/ conquest, transcultural communication, legal liability, multicultural majority/minority relations, ageism, sexism, gender, sexual orientation, the disabled/ADA. (Prerequisite: Recommendation: Completion of 10-809-196, Introduction to Sociology or 10-809-197, Contemporary American Society prior to this course) 3 cr.

**10-809-188 DEVELOPMENTAL PSYCHOLOGY** ...defines human development; examines theories; heredity and environmental effects; prenatal development and birth; evaluates biosocial, cognitive psychosocial development through the life span; aging, death, and dying. 3 cr.

**10-809-195 ECONOMICS** ...scarcity, resources, alternative economic systems, growth, supply and demand, monetary and fiscal policy, inflation, unemployment, and global economic issues. 3 cr.

**10-809-196 INTRODUCTION TO SOCIOLOGY** ...the nature and variety of groups; inequality, race and ethnicity; family, population, social integration, and change; collective behavior; politics, economics, religion, education, and the effects of technology. 3 cr.

**10-809-197 CONTEMPORARY AMER SOCIETY** ...the major social institutions within the American society: government, family, education, religion, and economic system. 3 cr.

**10-809-198 INTRODUCTION TO PSYCHOLOGY** ...survey of theoretical foundations of human behavior such as sensation and perception, motivation, emotions, learning, personality, psychological disorders, therapy, stress, and human diversity in personal, social and vocational settings. 3 cr.

**10-809-199 PSYCHOLOGY OF HUMAN RELATIONS** ...decision making, motivation, conflict resolution, learning strategies, growth and adjustment, diversity, psychological theories, relationships, psychological disorders, stress, career analysis, social psychology, and lifespan development. 3 cr.

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