

# Accounting

Program Code 101011

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

Offered part-time at the Marinette campus.

### PROGRAM DESCRIPTION

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

Graduates of this program will be able to:

- 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.
- Perform activity-based costing.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math (algebra recommended)
- Ability to use computer keyboard

### MATH LEVEL

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 Accounts Payable/Receivable Accountant, Payroll Accountant, Inventory Control Accountant, Cost Accountant, Public Accountant, Accountant, Tax Accountant, and Governmental/Nonprofit Accountant.

#### 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. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-101-110	Accounting 1	4
10-102-101	Financial Applications	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-132	Micro: Excel-Part 2	1
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-101-105	Accounting-Computer Ledger	2
10-101-120	Accounting 2	4
10-101-151	Accounting-Payroll	3
10-102-150	Law-Business	3
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology-Human Rel	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
10-104-108	Credit Procedures	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-101-142	Accounting-Managerial	3
10-101-143	Accounting-Govern/Nonprofit	2
10-101-156	Accounting-Auto Appl	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Accounting-Quickbooks (10-101-190), Financial Statement Analysis (10-102-172), Financial Management-Medical (10-101-145)

This program is fully eligible for financial aid.

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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.

**10-101-110 ACCOUNTING 1** ...accounting principles, financial statements, business transactions, accounting cycles/systems, specialized journals, accounting for cash, receivables, and temporary investments, inventories, fixed assets, payroll, notes payable, current liabilities, sole proprietorships, and partnerships.

**10-101-120 ACCOUNTING 2** ...concepts and principles covering corporations, capital stocks, dividends, bonds, amortization of bond premiums, and discounts; manufacturing, job order and process cost systems; variances; managerial application including decision making and financial 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, auditing, 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)

**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** ...Window commands, file management, worksheet applications, database applications, macros, evaluation of accounting software, installation of software, and conversion of manual accounting system to a computerized system. 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)

**10-103-121 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, creating charts; outlines, and web pages; and applying styles. 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Administrative Assistant Program Code 101066

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay and Marinette campuses. Information in Green Bay: (920) 498-5444. Information in Marinette: (715) 735-9361. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

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

All software materials prepare students to sit for the Microsoft Office User Specialist (MOUS) exams.

With additional education and/or work experience, students will be prepared for the Certified Administrative Professional (AP) exam.

Graduates of this program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- A keyboarding skill of 20 WPM using the TOUCH method is recommended.

### MATH LEVEL

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 Administrative Assistant, Legal Administrative Assistant, Medical Administrative Assistant, Office Assistant, Receptionist/Administrative Assistant, or Transcriptionist.

**ADMINISTRATIVE ASSISTANT:** schedules appointments; communicates effectively in person, on the phone, and in writing; transcribes dictation from notes or machines; prepares agendas; takes minutes; arranges itineraries; schedules travel plans; handles mail; uses word processing, spreadsheet, presentation graphics, and/or database software; and possibly supervises others.

**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.

**OFFICE ASSISTANT:** types, files, transcribes, does word processing, works with the telephone, makes appointments, keeps records, sets up meetings, and handles customer relations.

**RECEPTIONIST/ADMINISTRATIVE ASSISTANT:** receives and routes telephone calls, greets visitors, handles filing, mail, photocopying, and faxing; may provide administrative support at various levels within the organization.

**TRANSCRIPTIONIST:** uses transcribing machines and word processing equipment, proofreads, and verifies documents.

**With additional education and/or work experience, a graduate may find employment in a variety of specialties.**

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

### CURRICULUM

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

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-111	Micro: Windows-Introduction	1
10-103-121	Micro: Word-Introduction	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
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-103-131	Micro: Excel-Introduction	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	Communication-Written	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
10-103-162	Micro: FrontPage	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	Society-Amer Contemp	3
10-809-199	Psychology-Human Rel	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	Reporting-Technical	3
10-809-195	Economics	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

**SUGGESTED ELECTIVES:** Office Politics (10-106-157), Meetings-Organizing (10-106-171), Project Change Management 1-MS Project (10-107-151)

This program is fully eligible for financial aid.

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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.

### 10-103-111 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, creating charts; outlines, and web pages; and applying styles. Requires Windows experience.

**10-103-122 MICRO: WORD-PART 2** ...advanced word processing features including merge, sort and select; text flow; footnotes/endnotes, images, shapes, and WordArt; macros; shared documents; master and subdocuments; specialized tables and indexes; forms; and sharing data. Requires strong introductory Word skills.

### 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

...Lookup Wizards, action 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

...prepare overheads, handouts, and slide shows using Wizards, templates, Word Art, animations, transitions, and hyperlinks. Requires Windows experience.

**10-103-160 MICRO: OUTLOOK** ...use email, personal distribution list, signature, attachments, and task list; schedule appointments using calendar; flag, filter, sort, and merge contacts, add voting buttons, delivery receipts, and delivery dates to messages.

**10-103-162 MICRO: FRONTPAGE** ...create a FrontPage Web; customize and manage web pages and images; create and use interactive forms using frames; publish Office web pages to a web server.

### 10-103-165 MICRO: PUBLICATION SOFTWARE

...create newsletters, brochures, flyers, forms, business cards and other business publications using publication layout software.

### 10-106-103 INFORMATION PROCESSING PRINCIPLES

...information processing cycle and workflow, terminology, hardware, software, 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 45 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 50 wpm in a 5 minute timing. Requires touch keyboarding at 45 wpm.

### 10-106-126 ADMINISTRATIVE BUSINESS PROCEDURES 1

...today's global business environment, including time management using PIM software, flexible work arrangements, processing mail, meeting coordination, copiers and fax machines, and application of common business letters using appropriate formats. Requires Windows, intermediate Word, and PowerPoint experience.

### 10-106-136 ADMINISTRATIVE BUSINESS PROCEDURES 2

...today's global business environment including Internet-based research, event planning, integrating the use of personal digital assistants, virtual meeting technologies, financial responsibilities, travel coordination, job search, career advancement, and voice recognition.

### 10-106-137 INTEGRATED SOFTWARE APPLICATIONS

...manipulate and manage data to prepare integrated documents using Excel, Access, and publication software, create electronic portfolio from program rubrics using FrontPage, and use practice certification software tests to demonstrate Office Suite competencies.

### 10-106-142 SOFTWARE PROJECTS

...applying Windows 2000 and Word 2002 features to manage and format business documents while exercising decision-making skills and enhancing keyboarding in a team setting. Requires Windows and intermediate Word background.

### 10-106-144 ADMINISTRATIVE ASSISTANT INTERNSHIP

...employment with supervision of business employer and instructor; 144 work hours and 17 class hours with related projects, reports, and discussions. Recommended for graduating semester.

### 10-106-152 RECORDS MANAGEMENT

...major systems of classification: alphabetic, numeric, geographic, subject, chronologic, and micro systems; 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 features, equipment, messaging, cellular technology, pagers, electronic, and voice mail.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Applied Engineering Technology Program Code 106237

## ASSOCIATE DEGREE

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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.

The program provides students with a core background in general manufacturing sciences. The learner selects an area of specialization. The core curriculum introduces students to:

- 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.

Occupational support, general education and elective courses support this occupational curriculum so that a learner can earn an Associate of Applied Science degree. The program will incorporate a variety of delivery approaches intended to increase learner access to degree programs. The core curriculum and most of the specialized courses will be offered in both traditional classroom format and in an individualized learning format.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

High school algebra or equivalent. For a description of algebra skills, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

A graduate in the Applied Engineering Technology program works with manufacturing and industry improving productivity, quality and safety. This program allows the student to receive a background in all three areas, and to select one or more as a specialization.

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 you 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 you for those hands-on responsibilities.

A graduate specializing in Quality will have potential employment as a Quality Technician and will have the background to pursue certification with the ASQC. 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 18 credits of core course material, 15 credits of general education, 12 credits of occupational support courses, 6 credits of electives, and 15 credits of technical specialization. Upon graduation, a student will have completed 66 credits.

#### CORE COURSES

Course No.	Description	Credits
10-623-108	Manufacturing Materials	1
10-623-111	Manufacturing Processes	2
10-623-106	Interpreting Engineering Drawings	2
10-623-107	Manufacturing Practices	2
10-623-114	Material Resource Planning	2
10-623-100	Standards and Regulations	1
10-623-101	Quality Assurance	1
10-623-105	Precision Measuring	1
10-623-109	Problem Solving	2
10-623-103	Quality Systems	2
10-623-102	Statistical Process Control	2
<b>TOTAL</b>		<b>18</b>

#### GENERAL EDUCATION

10-801-195	Communication-Written	3
10-801-196	Oral/Interpers Comm	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
10-809-199	Psychology-Human Rel	3
<b>TOTAL</b>		<b>15</b>

#### OCCUPATIONAL SUPPORT

10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-151	Micro: PowerPoint-Introduction	1
10-804-130	Math-Algebra/Trig	3
10-804-131	Math-Algebra/Inter	3
10-806-150	Physics I-Technical	3
<b>ELECTIVE</b>		<b>6</b>
<b>TOTAL</b>		<b>12</b>

#### INDUSTRIAL/MANUFACTURING ENGINEERING TECHNICIAN SPECIALIZATION

10-623-121	Work Measurement	3
10-623-161	Facilities Planning	3
10-623-162	Process Improvement	2
10-623-163	Equipment Planning and Justification	2
10-623-164	Ergonomics/Safety	2
10-623-165	Process Planning	3
<b>TOTAL</b>		<b>15</b>

#### QUALITY ASSURANCE TECHNICIAN SPECIALIZATION

10-623-113	Quality Documentation	3
10-623-115	Cust/Vendor Rel/Audits	3
10-623-116	Inspection	3
10-806-131	Material Science	3
10-623-133	Quality Engineering	3
<b>TOTAL</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 and Inspections	3
<b>TOTAL</b>		<b>15</b>

#### SUGGESTED ELECTIVES:

10-449-105	Emergency Spill Response	3
10-449-106	Construction Safety	3

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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.

**10-449-100 SAFETY MANAGEMENT** ...this self-paced course provides an overview of 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 analysis. From this base knowledge the student will be able to coordinate safety policies and objectives in an orderly, consistent manner into existing functional area such as operations, finance, quality and environmental management.

**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: 10-804-130, Math-Algebra/Trigonometry)

*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.

**10-623-100 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: 10-804-130, Math-Algebra/Trigonometry)

**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.

**10-806-131 MATERIALS SCIENCE** ...classification and identification; mechanical properties; microscopic and spectrographic analysis of materials; heat treatment procedures of hardening, tempering, and annealing; surface treatment of steels; and effects of alloys on metals.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Apprenticeship

## OFFERED AT THE GREEN BAY, MARINETTE, AND STURGEON BAY CAMPUSES

Course information: Green Bay - (920) 498-5682, Marinette campus - (715) 735-9361, or Sturgeon Bay campus - (920) 743-2207. Toll free: (800) 422-NWTC.

### 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 are 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, or check out our Web site at: [www.nwtc.edu](http://www.nwtc.edu) [Apprenticeship].

### 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 Accuplacer 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 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  
Mammography  
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

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**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.

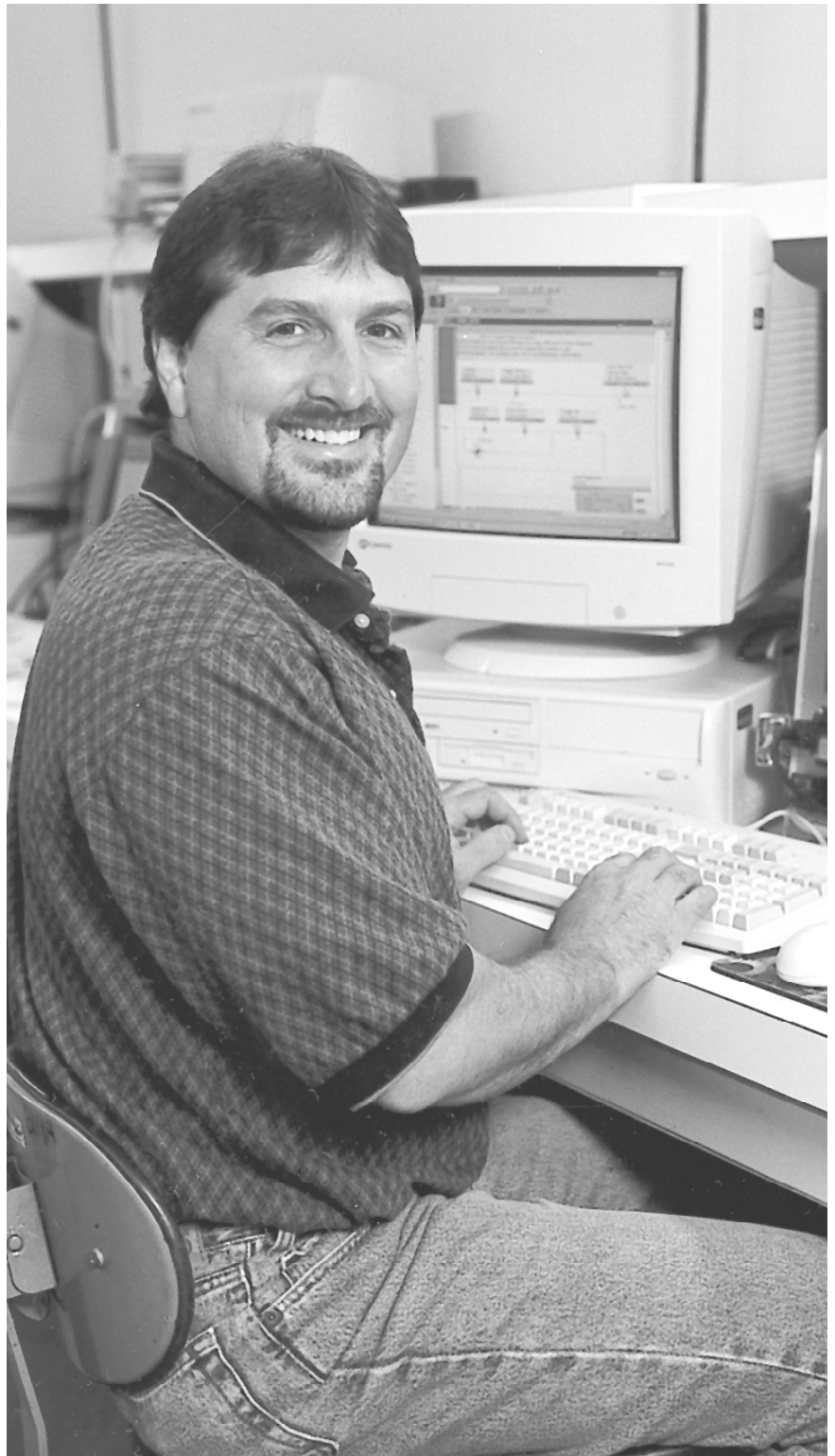
The apprentice is on a progressive wage scale with increases every six months, so that during the program the apprentice will average 60% of the skilled rate.

**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) 498-5682  
(800) 422-NWTC, Ext. 5682



Descriptions of courses not found on this page can be found in the back of the catalog.

# Architectural Technology Program Code 106141

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Architectural Technology prepares students to work in residential design, for architects, engineers, or material manufacturers, to produce drawings for wood, steel, masonry, and reinforced concrete structures.

Graduates of the Architectural Technology Program will be able to:

- 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 graphic architectural ideas 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Those who do not complete high school may establish their equivalency through GED testing or other entrance tests.)
- 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

### MATH LEVEL

Students should have mastered algebra skills before entering this program. 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 as an Architectural Technician, Building Materials Sales Person, Building Mechanical Technician, Shop Drawing Draftsperson, Structural Draftsperson, Residential Designer, as well as many other construction related positions.

**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 on a conventional drafting or CAD system 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 on a conventional drafting or CAD system 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, a graduate may find other opportunities for employment.**

- Architect
- Building Inspector
- Senior Draftsperson
- Commercial or Industrial Estimator
- Construction Engineer
- Structural Engineer

### CURRICULUM

The Architectural Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-614-115	Architectural Drafting Prin	4
10-614-119	CAD Architectural-Introduction	1
10-614-121	Materials-Building Const	3
10-801-196	Oral/Interpersonal Comm	3
10-804-130	Math-Algebra/Trigonometry	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-614-120	CAD-Architectural	2
10-614-128	Residential Design/Drafting	5
10-614-131	Structural Draft-Wood/Steel	3
10-804-131	Math-Algebra/Inter	3
10-806-150	Physics 1-Technical	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>19</b>

#### THIRD SEMESTER

10-614-135	Commercial Draft-Steel	4
10-614-141	Structural Draft-Concret	3
10-614-151	Estimating-Building	3
10-614-160	Structural Analysis	3
10-801-195	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

10-614-118	Commercial Drafting Practices	5
10-614-146	Systems-Mechanical	3
10-801-197	Reporting-Technical	3
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Survey/Site Development (10-607-107), Architectural Models Construction (10-614-175), Green Architecture (10-614-117)

This program is fully eligible for financial aid.

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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.

### **10-614-115 ARCHITECTURAL DRAFTING**

**PRINCIPLES** ...traditional methods to develop basic architectural drafting techniques, linework, lettering, and geometric construction; terminology and construction methods; residential working drawing interpretation. (Prerequisite: Accepted into Architectural)

### **10-614-118 COMMERCIAL DRAFTING**

**PRACTICES** ...this capstone course includes: highlights from program courses, preparing architectural working drawings for reinforced and pre-cast concrete framed buildings, the professional practice of architecture and the construction process. (Prerequisite: 10-614-135, Commercial Drafting-Steel)

### **10-614-119 CAD ARCHITECTURAL-**

**INTRODUCTION** ...introduction of basic AutoCAD commands and drafting techniques used to produce architectural drawings. (Prerequisites: Accepted into Architectural Technology AND computer literacy in Word, Excel, & Powerpoint)

### **10-614-121 MATERIALS-BUILDING**

**CONSTRUCTION** ...CSI materials filing system, general requirements/forms, site work, concrete, masonry, metals, wood and plastics, thermal/moisture protection, doors/windows, finishes and specialties, equipment/furnishings, special construction, and conveying systems. (Prerequisite: Accepted into Architectural)

### **10-614-128 RESIDENTIAL DESIGN/DRAFTING**

...residential design principles are incorporated in team projects and presentations while sketching, architectural drafting techniques using traditional and CAD methods are used to develop residential working drawings. (Prerequisites: 10-614-115, Architectural Drafting Principles; AND 10-614-121, Materials-Building Construction; AND 10-804-130, Math-Algebra/Trigonometry)

### **10-614-131 STRUCTURAL DRAFT-WOOD/STEEL**

...application of math to buildings, structural wood, and structural steel: standard methods of drawing structural wood and steel; familiarity with references used in structural wood and steel industries. (Prerequisites: 10-614-115, Architectural Drafting Principles; 10-614-121, Materials-Building Construction; 10-614-119 CAD Architectural-Intro).

### **10-614-135 COMMERCIAL DRAFTING-STEEL**

...preparation of architectural working drawings for steel frame buildings: plans, elevations, sections, and details. (Prerequisites: 10-614-120, CAD Architectural; 10-614-131, Structural Drafting-Wood/Steel; 10-614-128, Residential Design/Drafting)

### **10-614-141 STRUCTURAL DRAFT-CONCRETE**

...application of building loads and codes to determine structural member size, reinforced/prestressed concrete, precast concrete, and structural concrete drawing methods. (Prerequisites: 10-614-120, CAD-Architectural; 10-614-131, Structural Drafting-Wood/Steel)

### **10-614-146 SYSTEMS-MECHANICAL** ...plumbing,

HVAC/R, electrical systems, calculations, mechanical drafting, space requirements, codes, mechanical specification, and construction within the building. (Prerequisites: 10-614-128, Residential Design/Drafting; 10-614-120, CAD-Architectural; 10-806-150, Physics 1-Tech)

### **10-614-151 ESTIMATING-BUILDING** ...residential

materials take off and square foot material and labor costs along with construction techniques. (Prerequisites: 10-614-115, Architectural Drafting Principle; 10-614-121, Materials-Building Construction; 10-804-130, Algebra/Trigonometry)

### **10-614-160 STRUCTURAL ANALYSIS** ...mathematical

investigation of forces, force actions, beam and column design, properties of sections, and application to wood member structural design. (Prerequisites: 10-614-128, Residential Design/Drafting; 10-804-131, Algebra-Intermediate; 10-806-150, Physics 1-Tech)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Auto Collision Repair and Refinishing Technician

Program Code 324051

## TECHNICAL DIPLOMA - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

Visit the Auto Collision Repair and Refinish Web site - Youth Auto Training Certification information

### PROGRAM DESCRIPTION

Auto Collision Repair and Refinishing Technician prepares students to repair and refinish damaged bodies and parts of automobiles and light trucks. Graduates of the Auto Collision Repair and Refinishing Technician Program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High School diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High school background in mathematics, science, and technology education

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### ACCREDITATION:

- Certified ASE training site
- 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

### ASSOCIATION:

- National Institute for Automotive Service Excellence
- I-CAR Industry Training Alliance Member
- Wisconsin Auto Collision Technicians Association
- Bay Auto Body Association

### EMPLOYMENT POTENTIAL

A graduate of the program will have the potential for employment as an Auto Collision Repair Technician, Auto Collision Refinishing Technician, Frame and Alignment Technician, Uni-body Repair Specialist, and Trim and Glass Installer.

#### 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.

**UNI-BODY 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.

### CURRICULUM

The Auto Collision Repair and Refinishing Technician Technical Diploma is a two-year, four-semester program. Upon graduation, a student will have completed 55 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-405-101	Auto Collision Ref-Intro	1
* 10-405-103	Auto Collision Repair	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
31-801-385	Communicating-Writing	1
31-804-301	Math 1-Trades	2
32-405-320	Auto Collision Ind Shadow	1
<b>SEMESTER TOTAL</b>		<b>14</b>

#### SECOND SEMESTER

10-103-111	Micro: Windows-Introduction	1
10-103-121	Micro: Word-Introduction	1
10-405-120	Auto Collision Finish Def	2
10-405-124	Auto Refinishing-Advanced	3
10-405-128	Auto Color Adjustment/Tint	3
10-405-132	Auto Collision Damage Rprts	2
32-806-353	Science-Mechanics	2
<b>SEMESTER TOTAL</b>		<b>14</b>

#### THIRD SEMESTER

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>SEMESTER TOTAL</b>		<b>12</b>

#### FOURTH SEMESTER

10-405-122	Auto Collision Damage Analy	2
10-405-126	Auto Collision Structural	3
10-405-130	Auto Collision Sectioning	3
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
31-809-301	Social Science Survey	2
<b>SEMESTER TOTAL</b>		<b>15</b>

\*NOTE: 10-405-101 and 10-405-103 are necessary as prerequisites regardless if a student enters at the 1st or 3rd semester of the program.

NOTE: 10-405-100 and 10-405-102 may be taken in lieu of credit for 10-405-101 and 10-405-103.

NOTE: A student may start with Auto Collision Repair or Auto Collision Refinishing, both must be completed to graduate. 10-405-101 and 10-405-103 are prerequisites for all courses.

This program is fully eligible for financial aid.

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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.

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

**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. (Prerequisites: 10-405-103, Auto Collision Repair; 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: 10-405-103, 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)

**10-405-128 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)

**10-405-132 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 affected areas of the automobile regularly repaired by an Auto Collision Technician.

**10-602-117 WIRING/SCHEMATIC TECHNOLOGY** ...electrical symbols, wiring diagrams, tracing wiring circuits, and diagnosing electrical problems with wiring diagrams, \*\*design an automotive electrical circuit. (Prerequisite: 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 affected 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Auto Collision Repair and Refinish Technology

Program Code 104051

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

Visit the Auto Collision Repair and Refinish Web site - Youth Auto Training Certification information

### 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.

Graduates of the program will have the same employment potential as the graduate of the two-year technical diploma with the additional opportunities for employment as:

- Insurance Adjuster and Appraiser
- Auto Collision Repair and Refinishing Center Supervisor
- Auto Collision Repair and Refinishing Center Department Manager
- Equipment and Supplies Specialist

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.

### REQUIREMENTS FOR PROGRAM ENTRY

- NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.
- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
  - High school background in mathematics, science, and technology education

### MATH LEVEL

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 this program will receive all of the technical training that the two-year technical diploma program offers. In addition, the student will be provided with the opportunity to pursue a career as an Insurance Adjuster/Appraiser, Collision Center Owner, Collision Center Manager, and Manufacturers Representative.

**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

### ACCREDITATION:

- Certified ASE training site
- 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

### ASSOCIATION:

- National Institute for Automotive Service Excellence
- I-CAR Industry Training Alliance Member
- Wisconsin Auto Collision Technicians Association
- Bay Auto Body Association

### CURRICULUM

The Auto Collision Repair and Refinishing Technology Associate Degree is a two-year program. Upon graduation, a students will have completed 70 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-405-101	Auto Collision Ref-Intro	1
* 10-405-103	Auto Collision Repair	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	Communication-Written	3
10-801-196	Oral/Interpersonal Comm	3
10-804-120	Math-Tech Algebra	3
<b>SEMESTER TOTAL</b>		<b>19</b>

#### SECOND SEMESTER

10-405-120	Auto Collision Finish Def	2
10-405-124	Auto Refinishing-Advanced	3
10-405-128	Auto Color Adjustment/Tint	3
10-405-131	Auto Coll Refin Occup Exp	1
10-405-132	Auto Collision Damage Rprts	2
10-809-197	Society-Amer Contemp Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

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	Reporting-Technical	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

10-405-122	Auto Collision Damage Analy	2
10-405-126	Auto Collision Structural	3
10-405-130	Auto Collision Sectioning	3
10-405-133	Auto Coll Repair Occup Exp	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
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** 10-102-158 Business-Intro, 10-145-177 Small Business, 10-104-191 Customer Service Management.

**\*NOTE:** 10-405-101 and 10-405-103 are necessary as prerequisites regardless if a student enters at the 1st or 3rd semester of the program.

**NOTE:** 10-405-100 and 10-405-102 may be taken in lieu of credit for 10-405-101 and 101-405-103.

**NOTE:** A student may start with Auto Collision Repair or Auto Collision Refinishing, both must be completed to graduate. 10-405-101 and 10-405-103 are prerequisites for all courses.

This program is fully eligible for financial aid.

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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.

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

**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. (Prerequisites: 10-405-103, Auto Collision Repair; 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: 10-405-103, 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)

**10-405-128 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)

**10-405-131 AUTO COLLISION REFINISHING OCCUPATIONAL EXPERIENCE** ...utilize the program skills learned in the auto collision refinishing center environment. The student will be required to refinish vehicle damage with the skills learned to industry guidelines and timelines.

**10-405-132 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.

**10-405-133 AUTO COLLISION REPAIR OCCUPATIONAL EXPERIENCE** ...utilize the program skills learned in the auto collision center environment. The student will be required to repair vehicle damage with the skills learned to industry guidelines, and timelines.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Automotive Technician Program Code 324042

## TECHNICAL DIPLOMA - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC. The first year of the program is also offered on the Marinette campus. Course information: (715) 735-9361. Toll free: (800) 422-NWTC. Visit the Auto Collision Repair and Refinish Web site - Youth Auto Training Certification information

### 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 shop environment.

Graduates of the Automotive Technician Program will be able to:

- Diagnose and repair automotive engine performance systems.
- Diagnose and repair automotive suspension and steering systems.
- Diagnose and repair automotive brake systems.
- Diagnose and repair automotive DC electrical systems.
- Diagnose and repair automotive electronic systems.
- Diagnose and repair automotive heating and air conditioning systems.
- Diagnose and repair automatic transmission/transaxles.
- Diagnose and repair general internal automotive engines.
- Diagnose and repair automotive manual drive train and axles.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High school background in mathematics, science, and technology education

### MATH LEVEL

Students should have mastered basic math before entering this program. 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 an Automotive Service Technician, Automotive Electronics Specialist, Engine Repair Specialist, Transmission and Drive Train Specialist, Alignment Specialist, Service Manager, Assistant Service Manager, Service Writer, or Brake Specialist.

#### AUTOMOTIVE SERVICE TECHNICIAN:

diagnoses and locates trouble, makes the necessary repairs, chooses the correct parts replacements and adjustments on cars and light trucks.

#### AUTOMOTIVE ELECTRONICS SPECIALIST:

diagnoses and locates problems, makes necessary repairs as related to engine body and transmission computer controls.

**ENGINE REPAIR SPECIALIST:** disassembles engines, inspects engine components, reassembles to factory specifications.

#### TRANSMISSION AND DRIVE TRAIN

**SPECIALIST:** diagnoses and locates problems, makes necessary repairs to automatic and manual transmissions and drive members.

**ALIGNMENT SPECIALIST:** diagnoses, makes repairs, and adjusts suspension using computerized alignment equipment.

**SERVICE MANAGER or ASSISTANT SERVICE MANAGER:** meets customers and works with the technicians to help diagnose and locate vehicle trouble areas.

**SERVICE WRITER:** meets and greets customers, listens to and records customer repair requests, processes work orders for the automotive service technicians.

**BRAKE SPECIALIST:** perform brake system maintenance and 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 offered on both the Green Bay and Marinette campuses. Upon graduation, a student will have completed 64 credits.

#### FIRST SEMESTER

Course 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
10-602-129	Automotive Emission Systems	1
31-801-386	Communicating Effectively	1
31-804-301	Math 1-Trades	2
<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
31-419-311	Hydraulics-Applied	2
32-806-353	Science-Mechanics	2
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

10-602-137	Electronics Computer Tech	3
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
10-602-159	Auto Body Service Technology	1
31-809-301	Social Science Survey	2
<b>SEMESTER TOTAL</b>		<b>16</b>

The Automotive Technician Program is ASE certified in all eight automotive program areas. All staff are ASE certified.

**NOTE:** The program is offered on both the Marinette and Green Bay campuses.

This program is fully eligible for financial aid.

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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, \*10 hours off campus selected work experience. (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, \*10 hour off campus selected work experience. (Corequisite: 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, \*\*design an automotive electrical circuit. (Prerequisite: 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.

**10-602-124 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, \*10 hour off campus work experience. (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, \*\*research paper on automotive hybrids. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech)

**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 I 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 I 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, \*10 hour off campus work experience. (Corequisite: 10-602-160, Auto Preparation Technology; Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117 Wiring/Schematics Technology)

**10-602-137 ELECTRONICS COMPUTER TECHNOLOGY** ...knowledge and skill development related to computer controlled vehicle systems ranging from chassis systems through extensive emphasis on engine performance and driveability related controls, \*\*build an electrical circuit utilizing solid state electronic components. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech; 10-602-126, Chassis Electricity Tech)

**10-602-139 AUTO TRANS/TRANSAXLE TECHNOLOGY 1** ...transmission/transaxle safety, transmission fluid, transmission maintenance, test procedures, external transmission adjustments, and 5 hour off-campus work experience.

**10-602-140 AUTO TRANS/TRANSAXLE TECHNOLOGY 2** ...test procedures, transmission removal and installation, overhaul, electronic controls, input sensors, output sensors, and scanner diagnostics, 5 hour off-campus work experience.

**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, \*10 hour off campus selected work experience. (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, \*10 hour off campus selected work experience. (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, \*\*research paper on manufacturer's new product development regarding the electronic components. (Prerequisites: 10-602-118, DC Electricity Tech; 10-602-117, Wiring/Schematic Tech; 10-602-126, Chassis Electricity Tech)

**10-602-159 AUTOMOTIVE BODY SERVICE TECHNOLOGY** ...internal door components, body opening adjustments, exterior body components, seat removal/repair, and interior trim.

**10-602-160 AUTO PREPARATION TECHNOLOGY** ...personal safety, auto equipment safety, repair order information, industry computer applications, repair tools, fasteners, chemicals, vehicle preventive maintenance, \*\*research OSHA automotive shop safety requirements.

**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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Automotive Technology

Program Code 106023

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Automotive Technology Program will be able to:

- Diagnose and repair automatic transmission/transaxles.
- Diagnose and repair automotive heating and air conditioning systems.
- Diagnose and repair automotive manual drive train and axles.
- Diagnose and repair automotive brake systems.
- Diagnose and repair internal automotive engine components.
- Diagnose and repair automotive suspension and steering systems.
- Diagnose and repair automotive electrical system problems.
- Diagnose and repair automotive electronic engine control systems.
- Communicate effectively with the customer.
- Complete customer repair orders accurately.
- Organize a daily work schedule.
- Tabulate a daily time sheet of technicians repair work.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

### MATH LEVEL

Students should have mastered basic math before entering this program. 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 an Automotive Service Technician, Automotive Electronics Specialist, Engine Repair Specialist, Transmission and Drive Train Specialist, Alignment and Suspension Specialist, Service Writer, Shop Foreman, Service Manager, Parts Manager, Warranty Claims Person, or an Owner/Operator.

**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 them.

### Recommended off campus work experiences; 20 hours in each area;

- Automotive Service Writer
- Automotive Service Manager
- Automotive Shop Foreman
- Automotive Parts Manager
- Automotive Warranty Claims Person
- Automotive Service Department Manager
- Automotive Human Relations Manager
- Other areas with instructor's approval

### 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 72 credits.

#### FIRST SEMESTER

Course 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
10-801-196	Oral/Interpersonal Comm	3
10-804-120	Math-Tech Algebra	3
<b>SEMESTER TOTAL</b>		<b>19</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
* 10-602-129	Automotive Emission Systems	1
10-801-195	Communication-Written	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>19</b>

#### THIRD SEMESTER

* 10-602-135	Heating/Cooling AC Tech	4
* 10-602-145	Engine Repair Technology	5
10-801-197	Reporting-Technical	3
	Elective	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

* 10-602-137	Electronics Computer Tech	3
* 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
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SUGGESTED ELECTIVES:

10-602-147 Electronics Manufacture Specific-3 credits,  
10-102-158 Business Introduction-3 credits,  
10-104-191 Customer Service Management-3 credits

**NOTE** \* A 3 to 5 page paper is required for each area experienced. The paper will include job title, work experience, responsibilities, normal work hours, and interpersonal skills required. Assess from your time on the job what possible classes and/or work experience would be beneficial to a person pursuing a job in this area. A grade in the work experience will be based on employer input and the paper.

**NOTE:** \*\* Specific project information to be obtained from program instructor.

This program is fully eligible for financial aid.

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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, \*10 hours off campus selected work experience. (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, \*10 hour off campus selected work experience. (Corequisites: 10-602-160, Auto Preparation Technology; 10-602-118 DC Electricity Technology)

**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, \*10 hour off campus work experience. (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, \*10 hour off campus work experience. (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, external transmission adjustments, and 5 hour off-campus work experience.

**10-602-140 AUTO TRANS/TRANSAXLE TECHNOLOGY 2** ...test procedures, transmission removal and installation, overhaul, electronic controls, input sensors, output sensors, and scanner diagnostics, 5 hour off-campus work experience.

**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, \*10 hour off campus selected work experience. (Corequisite: 10-602-160, Auto Preparation Technology)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Business Administration Credit

Program Code 101041

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Business Administration Credit prepares learners for a career in credit management. The learners will comprehend the concepts of leadership, demonstrating promotion, control, and collection of consumer and business transactions.

Graduates of this program will be able to:

- Establish internal credit policies and procedures.
- Process credit applications.
- Conduct credit investigations.
- Analyze business and consumer financial statements.
- Make credit decisions.
- Develop credit related documents.
- Contact customers regarding outstanding balances.
- Negotiate payment proposals with customers.
- Resolve collection issues/problems.
- Resolve discrepancies in customer's 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.
- Use a financial calculator.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard

### MATH LEVEL

Students should have mastered basic math skills before entering this program. 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 Credit Manager Trainee, Assistant Credit Manager, Credit Specialist, Collection Specialist, Personal Banker, and Loan Officer.

**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

### CURRICULUM

The Business Administration Credit Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 67 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-102-158	Business-Intro	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-132	Micro: Excel-Part 2	1
10-104-111	Credit-Consumer	4
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-101-110	Accounting 1	4
10-102-150	Law-Business	3
10-104-117	Credit-Business	4
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

* 10-102-101	Financial Applications	3
10-102-161	Law-Credit	4
10-102-166	Collection Methods	3
10-104-121	Credit Management Practices	3
10-809-195	Economics	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

10-102-172	Financial Statement Analy	3
10-104-122	Credit-Customer Serv/Sales	3
10-104-146	Credit Internship	3
10-809-197	Society-Amer Contemp	3
	Elective	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

**SUGGESTED ELECTIVES:** Any course in the Financial Institutions Management or Accounting program.

\* Note: Strongly recommend students take Accounting 1 prior to enrolling in Financial Applications.

This program is fully eligible for financial aid.

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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.

**10-102-150 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.

**10-102-161 LAW-CREDIT** ...Uniform Commercial Code, credit regulations, Wisconsin Consumer Protection Law, collection law, and bankruptcy. (Prerequisite: 10-104-111, Credit-Consumer)

**10-102-166 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: 10-104-111, Credit-Consumer)

### **10-102-172 FINANCIAL STATEMENT ANALYSIS**

...types of financial statements, methods of preparation and types of financial statement analysis, statement analysis and evaluation procedures for determining financial condition of organization, and forecasting and control. (Prerequisite: 10-101-110, Accounting 1)

**10-104-111 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.

**10-104-117 CREDIT-BUSINESS** ...credit in the business world and company, organizing credit department, policy, procedures, terms and conditions of sale, credit investigations, credit lines, credit decisions, credit forms, international credit and business fraud. (Prerequisite: 10-102-158, Business-Intro)

### **10-104-121 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.

### **10-104-122 CREDIT-CUSTOMER SERVICES & SALES**

...will address the customer service and sales issues faced by a business credit department. Proper phone and face-to-face etiquette with credit customers will be emphasized. (Prerequisite: 10-102-166, Collection Methods)

**10-104-146 CREDIT INTERNSHIP** ...internship or field observations, career exploration, self exploration, career planning, and career placement. Course should be taken during the last semester.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Civil Engineering Technology Program Code 106071

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC. Visit the Civil Engineering Technology Web site at [www.nwtc.edu](http://www.nwtc.edu).

### PROGRAM DESCRIPTION

Graduates of this 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.

- Students will understand operating systems, spreadsheets, word processing, CAD and other software products to efficiently perform assignments in an engineering office environment.
- Students will be able to solve engineering, surveying and materials testing problems using algebra, trigonometry, and calculus.
- 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 various civil engineering projects.
- The student will understand and be able to describe different methods of building construction and elements of inspection and construction documentation.
- The student will be capable of producing written and oral reports related to work within the industry and learn techniques to adapt to the work environment.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High school background in mathematics, science, and drafting
- Algebra and trigonometry skills
- Attendance at orientation or a planned meeting with program staff is required.

### MATH LEVEL

Students must have mastered algebra and trigonometry skills and have completed or tested out of Algebra/Trigonometry, course 10-804-130, before taking the following First Semester program courses

- Soil Mechanics
- Surveying / Mapping

### EMPLOYMENT POTENTIAL

A graduate of the program will have the potential for employment as a Civil Construction Inspector, Civil Drafter, Civil Soils-Materials Technician, and Survey Technician.

**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, 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 station, data collectors, transits, theodolites, distance measurement equipment, global positioning systems, and other surveying instruments following approved surveying practices.

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

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

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

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

Some four-year colleges accept credits from the program for students wishing to pursue baccalaureate degrees in related fields.

### CURRICULUM

The Civil Engineering Technology- Associate Degree is a two-year plus one summer, five semester program. Upon graduation, a student will have completed 72 credits.

#### FIRST SEMESTER

Course 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
10-804-131	Math-Algebra/Inter	3
10-806-150	Physics 1-Technical	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-607-102	Land Surveying/Computer Appl	1
10-607-111	Cemented Aggregate Mixtures	3
10-607-125	Civil Public Works Construct	2
10-801-195	Communication-Written	3
10-804-132	Math-Geometry/Analytic	3
10-806-160	Physics 2-Technical	3
OR		
10-806-186	Intro to Biochemistry	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SUMMER SEMESTER

10-607-190	Civil Engineering Internship	2
<b>SEMESTER TOTAL</b>		<b>2</b>

#### THIRD SEMESTER

10-607-131	Surveying 2	4
10-607-134	Surveying-Drafting	3
10-607-135	Statics/Strength Matl-Civil	4
10-801-196	Oral/Interpersonal Comm	3
10-804-170	Math 3-Tech Calculus	4
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-607-147	Water Technology	3
10-607-150	Land Surveying Law	2
OR		
10-607-151	Highway Surveying	2
OR		
10-607-152	Construction Meth/Bldg Syst	2
OR		
10-607-153	Global Positioning Systems	2
10-801-197	Reporting-Technical	3
10-809-199	Psychology-Human Rel	3
Elective		2
Elective		2
Elective		2
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Students should take 3 of the 4 following electives; Highway Surveying Technology (10-607-151), Global Positioning Systems (10-607-180), Land Surveying Law 2 (10-607-163), and Construction Methods and Building Systems (10-607-152).

This program is fully eligible for financial aid.

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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.

### **10-606-112 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: 10-606-119, Sketching-Technical or 10-607-119, Civil Drafting Technology; Prerequisite: Familiarity with Windows file management)

### **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; and Instructor approval)

### **10-607-111 CEMENTED AGGREGATE MIXTURES**

...inspection/testing concepts, material sampling procedures, aggregate properties, Portland cement concrete mix design methods, hot mix asphalt design, field laboratory quality control testing. ACI Grade I and WisDOT PCCTEC I/IA certifications are available through this course. (Prerequisites: 10-607-128, Soil Mechanics and Instructor approval needed)

### **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 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. (Prerequisite: 10-804-130, Algebra/Trigonometry; Corequisites: 10-606-113, CAD; Accepted into Civil Program)

### **10-607-125 CIVIL PUBLIC WORKS CONSTRUCT**

...horizontal curves, sewer/water systems, civil engineering mapping, field inspector roles, and CAD applications. (Prerequisites: 10-606-113, Computer Aided Drafting; 10-607-121, Surveying and Mapping; and Instructor approval needed)

### **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. Use and transportation of portable nuclear density gauges certification available. (Prerequisites: 10-804-130, Algebra/Trigonometry, Instructor approval needed) Certification in the use and transfer of portable nuclear density gauges is available through this course.

### **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: 10-607-127, Public Works Construction and Instructor approval needed)

### **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. (Prerequisites: 10-607-131, Surveying 2 and Instructor approval needed)

### **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: 10-804-132, Geometry-Analytic; 10-806-150, Physics 1-Technical and Instructor approval needed)

**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: 10-804-131, Algebra-Intermediate; 10-806-150, Physics 1-Tech and Instructor approval needed)

**10-607-150 LAND SURVEYING LAW** ...history of property law, laws of evidence, unwritten rights, adverse possession, research and planning for a boundary survey, apportionment for land and water boundaries, and ethics of a land surveyor. (Prerequisites: 10-607-134, Surveying-Drafting and Instructor approval needed)

### **10-607-151 HIGHWAY SURVEYING**

**TECHNOLOGY** ...vertical curves, road design, volume calculations, site planning, astronomical observations, and construction staking. (Prerequisites: 10-607-131, Surveying 2 and Instructor approval needed)

### **10-607-152 CONSTRUCTION METHODS AND**

**BUILDING SYSTEMS** ...building components, construction methods, construction materials, plans, specifications, and print reading. (Prerequisites: 10-607-111, Cemented Aggregate Mixtures; 10-607-127, Public Works Construction and Instructor approval needed)

### **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: 10-607-131, Surveying 2 and Instructor approval needed)

### **10-607-190 CIVIL ENGINEERING INTERNSHIP**

...the application of theory, skills, and techniques in the civil engineering profession. (Prerequisite: Instructor approval needed)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Clinical Laboratory Technician Program Code 105131

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

This program prepares learners to act as an entry level Clinical Laboratory Technician. 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.

Graduates of the Clinical Laboratory Technician Program will be able to:

- 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.

Students are required to purchase uniforms, provide their own transportation to clinical facilities, and pay for liability insurance for the Clinical Practicum course.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

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

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.

### 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Minimum standard composite score of 20 on the ACT assessment.
- High school diploma or equivalent.
- Two years of algebra or one year of algebra and one year of advanced math (or attain a minimum of 80% on the NWTC algebra examination).
- One year of biology or equivalent.
- One year of chemistry or equivalent. (All courses should have been completed with a C or better grade.)
- Have completed a medical examination satisfactorily within three months before entering program.
- Strongly recommend attendance in the Program Orientation session.
- All students are required to complete an American Heart Association Health Care Provider CPR course prior to Clinical Practicum. Students are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.

### MATH LEVEL

Students should have mastered basic math skills and Accuplacer tests for algebra. For a description of basic math, see the Basic Education section of this catalog.

**NOTE:** Students who do not meet the above requirements should consult an NWTC counselor about ways to make up any deficiencies through testing or course work.

### CURRICULUM

The Clinical Laboratory Technician Associate Degree is a two-year, five-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-513-110	Basic Lab Skills	1
* 10-513-111	CLT Phlebotomy	2
* 10-513-113	QA-Laboratory Math	1
* 10-513-115	Basic Immunology Concepts	2
10-801-196	Oral/Interpersonal Comm	3
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	Communication-Written	3
* 10-806-197	Microbiology	4
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

10-809-195	Economics	3
10-809-196	Intro to Sociology	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### FOURTH SEMESTER

* 10-513-130	Advanced Hematology	2
* 10-513-131	Intro-Clinic Chem Diagnostics	3
* 10-513-132	Adv Clinic Chem Diagnostics	2
* 10-513-133	Clinical Microbiology	4
10-809-198	Intro to Psychology	3
	Elective	2
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FIFTH SEMESTER

* 10-513-140	Adv Topics in Microbiology	2
* 10-513-161	Clinical Lab-Practicum 1	5
* 10-513-162	Clinical Lab-Practicum 2	3
* 10-513-163	Clinical Lab-Practicum 3	3
<b>SEMESTER TOTAL</b>		<b>13</b>

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Clinical Laboratory Technician students must fulfill this requirement.

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

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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.

**10-513-110 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. (Prerequisites: 10-513-106, Clinical Lab Chemistry 1 and Accepted into Clinical Laboratory Technician Program)

**10-513-111 CLT-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/LABORATORY 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. (Prerequisites: High School Chemistry or Equivalent; and 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. (Prerequisite: Accepted into Clinical Laboratory Technician)

**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 INTRODUCTION TO CLINICAL CHEMISTRY DIAGNOSTICS** ...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, lipoids, proteins, renal function and blood gas analysis. (Prerequisites: 10-513-110, Basic Lab Skills; 10-513-113, QA/Lab Math; 10-806-177, Anatomy/Physiology-General; 10-513-114, Urinalysis; 10-806-199, Chemistry-Organic & Biological)

**10-513-132 ADVANCED CLINICAL CHEMISTRY DIAGNOSTICS** ...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, Introduction to Clinical Chemistry Diagnostics)

**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 TOPICS IN 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. (Prerequisite: 10-513-133, Clinical Microbiology)

**10-513-161 CLINICAL LAB-PRACTICUM** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Advanced Clinic Chemistry; Corequisites: 10-513-162, Clinical Lab-Practicum 2; 10-513-163, Clinical Lab-Practicum 3)

**10-513-162 CLINICAL LAB-PRACTICUM** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Advanced Clinic Chemistry; Corequisites: 10-513-161, Clinical Lab-Practicum 1 and 10-513-163, Clinical Lab-Practicum 3)

**10-513-163 CLINICAL LAB-PRACTICUM** ...clinical applications of knowledge and procedures in hematology/coagulation, urinalysis, microbiology, blood bank, chemistry/serology, preparation for MLT certification examinations. (Prerequisite: 10-513-132, Advanced Clinic Chemistry; Corequisites: 10-513-161, Clinical Lab-Practicum 1 and 10-513-162, Clinical Lab-Practicum 2)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Computer Numeric Control (CNC) Technician

Program Code 324441

## TECHNICAL DIPLOMA - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

A second year of advanced CNC (Computer Numeric Control) machining for graduates of the Machine Tool Operation program. Graduates of the Computer Numeric Control Technician Program will be able to:

- Control multiple axis CNC machines.
- Use efficient production set up techniques.
- Use advanced CNC programming techniques.
- Control optional features on CNC machines.
- Design and construct jigs and fixtures.
- Program 3-D surface machining operations.
- Use precision measuring practices.

### PROFILE OF INCOMING STUDENTS

- Like to work with numbers
- Accurate with numbers
- Problem solver
- Critical thinker
- Like to organize information
- Able to work with and meet deadlines

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

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 Computer Numerical Controlled (CNC) Operator, Jig and Fixture Apprentice/Trainee, Machinist Apprentice/Trainee, and Manufacturing Engineering Technician.

### 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 CNC Technician Technical Diploma is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
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
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>17</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
31-804-302	Math 2-Trades	1
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

31-442-350	Welding-Machine Trades	2
31-804-303	Math 3-Trades	1
32-420-301	Tool Making	4
32-420-303	Tooling Design	2
32-420-332	CNC Fundamentals 3	2
32-420-335	CNC Turning Operation	3
32-420-336	CNC Machining Center Oper	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

31-809-301	Social Science Survey	2
32-420-305	Machine Applications-Advanced	4
32-420-307	Machining Theory-Advanced	2
32-420-308	Metrology	1
32-420-342	CNC Fundamentals 4	2
32-420-346	CNC Techniques 1-Advanced	3
32-420-347	CNC Techniques 2-Advanced	3
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

## 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.

**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.

**31-442-350 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.

**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)

**32-420-332 CNC FUNDAMENTALS 3** ...CNC production planning, advanced 2-D mill programming, 3-D surface programming for CNC milling, conversational and G-code programming for milling machines, and computer assisted CNC programming for milling operations. (Prerequisite: 31-420-349, CNC Fundamentals 2)

**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: satisfactory completion of the Machine Tool Operations program)

**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: satisfactory completion of the Machine Tool Operations program)

**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: 32-420-332, CNC Fundamentals 3)

**32-420-346 CNC TECHNIQUES 1-ADVANCED** ...workholding, cutting tools, and toolholders; productivity improvement; programmable tailstock operation; bar feeder operation; live tooling and c-axis control; advanced programming techniques. (Prerequisites: 32-420-335, CNC Turning Operation; 32-420-336, CNC Machining Center Operation)

**32-420-347 CNC TECHNIQUES 2-ADVANCED** ...special CNC control techniques, use of canned cycles, special programming functions, 3D surface machining, production machining. (Prerequisites: 32-420-335, CNC Turning Operations; 32-420-336, CNC Machining Center Operation)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Criminal Justice - Corrections

Program Code 105042

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Students relate theory to current practice trends, problems, and issues. Criminal justice students study correctional counseling, sociology, and security.

Graduates of the Criminal Justice - Corrections Program will be able to:

- 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 juvenile detention officer.
- Be eligible to become a state certified jail officer.
- Apply basic math skills.
- Demonstrate keyboarding and computer skills.

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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- Good writing and communication skills
- Strong organizational skills

### MATH LEVEL

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 this program will have the potential for employment as a Correctional Officer, Youth Care Worker, and Detention Worker.

**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.

**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 entry-level employment.

### 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

Course 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-Human Rel	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
10-801-195	Communication-Written	3
10-804-152	Math-Protective Services	3
10-809-197	Society-Amer Contemp	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

#### THIRD SEMESTER

10-103-121	Micro: Word-Introduction	1
10-103-141	Micro: Access-Intro	1
10-504-118	Protective Services-Tech Repor	3
10-504-129	Correctional Interviewing	3
10-504-132	Courts/Jurisdiction	3
10-801-198	Speech	3
	Elective	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
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

**SUGGESTED ELECTIVES:** Narcotics and Vice Investigation (10-504-151), Corrections Internship (10-504-171).

Students interested in pursuing the Community Corrections Certificate will complete the following electives: Treatment of Criminal Offenders (10-504-119); Investigating High Tech Crime (10-504-127); Understanding Substance Abuse (10-550-170); and Workplace Spanish I (10-802-101).

Electives required for State certification are: Principles of Subject Control (POSC) Training (10-504-188) and Jail Health Care & Fire Safety (10-504-179).

A student must successfully complete 15 credits from the program before he/she is eligible to take the following certification requirement courses: Principles of Subject Control (10-504-188) and Jail Health Care & Fire Safety (10-504-179).

This program is fully eligible for financial aid.

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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.

**10-504-114 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.

**10-504-122 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.

**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 cleaning; 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Criminal Justice - Law Enforcement

Program Code 105041

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counsel: (920) 498-5444. Course information (920) 498-5543. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Criminal Justice-Law Enforcement Program will be able to:

- Qualify for entry level positions in protective services.
- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- Good writing and communication skills
- Strong organizational skills

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

Wisconsin Training and Standards requires a completed criminal background check in order to successfully complete certifiability for training standards. Based upon results of the criminal background check, a student may be denied enrollment in some courses.

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Police Officer, Deputy Sheriff, DNR Officer, State Trooper, Military Law Enforcement Officer, Private Investigator, Security Guard, or Correctional Officer.

**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 businesses and industry.

**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

**NOTE:** A student must successfully complete 30 credits of specific courses within the program before being eligible to take the following certification requirement course: Defensive & Arrest Tactics (10-504-175).

A student must successfully complete 30 credits of specific courses within the program before being eligible to take the following certification requirement courses: Firearms (10-504-177) and EVOG/First Responder (10-504-174).

**NOTE:** DAAT is not a necessary pre-requisite for EVOG. Must have 30 transcribed credits.

### CURRICULUM

The Criminal Justice - Law Enforcement Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course 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
10-804-152	Math-Protective Services	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-103-121	Micro: Word-Introduction	1
10-103-141	Micro: Access-Intro	1
10-504-142	Constitutional Law	3
10-504-144	Community Police Strategies	3
10-801-195	Communication-Written	3
10-801-198	Speech	3
10-809-199	Psychology-Human Rel	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
10-806-151	Science-Police Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-504-121	Traffic Application	3
10-504-143	Forensic Application	3
10-504-170	Juvenile Law	3
10-504-174	Emergency Medical	2
10-809-197	Society-Amer Contemp Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Defense/Arrest Tactics (10-504-173), Firearms Training (10-504-180), Police Traffic Radar (10-504-182), Law Enforcement Scenario (10-504-113).

This program is fully eligible for financial aid.

All Corrections Science core courses are also recommended electives. Electives required for State certification are: 1) Emergency Medical (10-504-174), 2) Defense & Arrest Tactics (DAAT)/Firearms Training (10-504-173), and 3) Oleoresin Capsicum (O.C.) Training (47-504-462).

**NOTE:** A 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: 1) Emergency Medical (10-504-174), and 2) Defense & Arrest Tactics (DAAT)/ Firearms Training (10-504-173).

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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.

**10-504-112 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.

**10-504-120 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. (Prerequisite: 10-504-140, Criminal Investigation)

**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.

**10-504-174 EMERGENCY MEDICAL** ...emergency patrol vehicle use and emergency first aid at the scene.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Dental Assistant

Program Code 315081

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Dental Assistant program trains students to prepare patients for treatment, sterilize instruments, and assist the dentist at chairside.

Graduates of the Dental Assistant Program will be able to:

- Assist with chairside procedures.
- Manipulate dental materials.
- Perform laboratory duties.
- Execute infection control/universal precaution techniques.
- Prepare to treat various dental patients.
- Perform Radiographic/Imaging Techniques/Processing.
- Maintain inventory.
- Perform receptionist/front office duties.
- Maintain dental equipment.

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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- An acceptable level on required entrance tests
- High school diploma or equivalency or youth option student
- Computer or keyboarding skills
- Medical and dental examinations satisfactorily completed before entering the program
- A science background with emphasis in advanced biology and anatomy and physiology is desirable
- Medical and dental examinations must be satisfactorily completed prior to entering second semester. Students are required to complete the American Heart Association Health Care Provider CPR Course prior to the DA Clinical Infection Control course.
- Hepatitis vaccination is required prior to first clinic course.

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

The program prepares graduates to work with dentists as they examine and treat patients. Dental assistants with documented skills also may carry out a variety of laboratory, clinical, and office duties. Some dental assistants manage the office and are responsible for patient scheduling and bookkeeping functions. Most dental assistants work in general or specialty dental offices, either for individual dentists or for groups of dentists. Some dental assistants may choose to 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

**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) \$225.00, 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.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### CURRICULUM

The Dental Assistant Technical Diploma is a one-year, three-semester program. Upon graduation, a student will have completed 31 credits.

The 2nd and 3rd semesters are 14 weeks on campus and 3 weeks off campus for clinical.

#### FIRST SEMESTER

A non-traditional semester offered in June and August to students accepted into the Dental Assistant program and high school seniors applying to the Dental Assistant program.

Course No.	Description	Credits
31-508-309	Dental/Pers Relationship	1
31-508-325	Dental Asst Clin Infect Ctrl	1
31-508-328	Dental Office Med Emergency	1
<b>SEMESTER TOTAL</b>		<b>3</b>

#### SECOND SEMESTER

31-508-310	Dental Science-Biomedical	2
31-508-311	Dental Asst 1-Chairside	4
31-508-312	Dental Materials	4
31-508-313	Radiography 1-Dental Asst	2
31-508-318	Dental Clinic Exp 1	2
<b>SEMESTER TOTAL</b>		<b>14</b>

#### THIRD SEMESTER

31-105-303	Dental Office Mgmt	1
31-508-322	Dental Clinic Exp 2	2
31-508-324	Dental Lab Procedures	3
31-508-326	Dental Asst 2-Chairside	4
31-508-329	Radiography 2-Dental Asst	2
<b>SEMESTER TOTAL</b>		<b>12</b>

#### May be taken at any time prior to graduation.

31-801-385	Communicating-Writing	1
31-801-386	Communicating-Interpers	1
<b>TOTAL</b>		<b>2</b>

**NOTE:** Students must have a C average to graduate from the Dental Assistant Program. Students who do not meet this requirement would have to repeat courses with a below C grade to graduate.

**CERTIFICATION:** Graduates of the program are eligible to take the national certification exam offered by the Dental Assisting National Board (DANB), (312) 642-3368. The Dental Assistant program is accredited by the American Dental Association-Commission on Dental Accreditation.

This program is fully eligible for financial aid.

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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.

### **31-105-303 DENTAL OFFICE MANAGEMENT**

...uses of a dental computer program, appointment control, records management, recall programs, fees, payment plans, collections, and insurance.

### **31-508-309 DENTAL/PERSONAL**

**RELATIONSHIPS** ...history, the dental team, ethics, jurisprudence, risk management, nutrition, and personal improvement; psychology of management skills; and the importance of working as a team. (Prerequisite: Accepted into Dental Assistant)

### **31-508-310 DENTAL SCIENCE-BIOMEDICAL**

...immunology, oral embryology, various pathogenic and nonpathogenic micro-organisms, and oral pathology.

### **31-508-311 DENTAL ASSISTANT 1-CHAIRSIDE**

...dental office components, infection control procedures, instruments transfer, oral evacuation, 4/6 handed dentistry, instrument identification, tray set-ups, oral health, dental dam application, rotary and handpiece identification. (Prerequisites: Accepted into Dental Assistant; Completion of 1st semester courses; CPR course)

**31-508-312 DENTAL MATERIALS** ...dental material properties, lab infection control and hazardous material handling, impression materials, care of lab and operating equipment, gypsum products, restorative and preventive materials, and tray set-ups. (Prerequisites: Completion of 1st semester courses; CPR course)

### **31-508-313 RADIOGRAPHY 1-DENTAL ASSISTANT**

...introduction to exposing, processing, mounting, and evaluation of radiographs, darkroom maintenance and radiation protection and safety. Course also includes charting, oral and dental anatomy, morphology, embryology, and histology. (Prerequisites: Successful completion of 1st semester courses; CPR course)

### **31-508-318 DENTAL CLINICAL EXPERIENCE 1**

...practical experience in patient relations, chairside skills, dental materials and limited radiography in various dental offices and the on-campus clinic. (Prerequisites: Successful completion of 1st semester courses; CPR course; Corequisites: 31-508-310, Dental Science Biomedical; 31-508-311, Dental Asst 1-Chairside; 31-508-312, Dental Materials; 31-508-313, Radiography 1-Dental Assist)

### **31-508-322 DENTAL CLINICAL EXPERIENCE 2**

...advanced practical experience in patient relations, chairside skills, laboratory procedures, radiography, dental materials, specialties, emergency procedures, and business office operations in the dental office and the on-campus clinic. (Prerequisite: Successful completion of 1st & 2nd semester courses; Corequisites: 31-105-303, Dental Office Management; 31-508-324, Dental Lab Proc; 31-508-326, Dental Asst 2-Chairside; 31-508-329, Radiography 2-Dental Asst)

### **31-508-324 DENTAL LABORATORY**

**PROCEDURES** ...taking and pouring of impressions, model trimming, denture and crown/bridge prosthesis, construction of acrylic trays, temporary restorations, mouth guards and bleaching trays, impressions materials and waxes, and surgical dressings. (Prerequisite: Successful completion of 1st and 2nd semester courses)

### **31-508-325 DENTAL ASSISTANT CLINICAL INFECTION CONTROL/SAFETY COMPLIANCE**

...disease transmission, hazard communication management, disinfection/treatment room and sterilization/instrument care. (Prerequisite: Accepted into Dental Assistant Program)

### **31-508-326 DENTAL ASSISTANT 2-CHAIRSIDE**

...occupational health and safety, management and maintenance of dental office and inventory, coronal polishing, fluoride application, prevention and operative dentistry, periodontics, oral surgery, orthodontics, pediatrics, and special patients. (Prerequisite: Successful completion of 1st and 2nd semester courses)

### **31-508-328 DENTAL OFFICE MEDICAL**

**EMERGENCIES** ...prevention, recognition and treatment of medical emergencies in the dental office as well as patient health history, vitals, airways, resuscitation equipment, emergency kits, and an overview of pharmacology. (Prerequisite: Accepted into Dental Assistant Program)

### **31-508-329 RADIOGRAPHY 2-DENTAL ASST**

...radiation theory, safety procedures, dental exposure techniques, evaluation techniques, and clinical application. (Prerequisite: Successful completion of 1st & 2nd semester courses)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Dental Hygienist

Program Code 105081

## ASSOCIATE DEGREE - TWO YEARS PLUS ONE SUMMER

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Dental Hygienist program prepares students to perform oral prophylaxis, apply preventive agents, expose radiographs, and teach patients oral care.

Graduates of the Dental Hygienist program will be able to:

- Discern and manage the ethical issues of dental hygiene practice.
- Acquire and synthesize information in a critical, scientific, and effective manner.
- Provide planned educational services using appropriate interpersonal communication skills and educational strategies.
- Initiate and assume responsibility for health promotion and disease prevention activities for diverse populations.
- Systematically collect, analyze, and accurately record baseline data on the general, oral, and psychosocial health status of clients.
- Discuss condition of oral cavity, identify actual and potential problems, etiological and contributing factors, and record alternative treatment.
- Provide treatment that includes preventive and therapeutic service designed to promote and maintain oral health and assist client in achieving goals.
- Evaluate effectiveness of planned clinical and educational services and modify as necessary.

Students will be required to purchase uniforms and instruments and pay for liability insurance for dental clinical courses.

### MATH LEVEL

Students should have mastered basic math skills and Accuplacer tests for algebra. For a description of basic math, see the Basic Education section of this catalog.

**NOTE:** A student who does not meet the above requirements should consult an NWTC counselor about ways to make up any deficiencies through testing or course work. Advance Standing Test Out is available in Radiography and Dental Materials.

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Dental Hygienist students must fulfill this requirement.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### EMPLOYMENT POTENTIAL

Prior to licensure as a Registered Dental Hygienist, a student is required to pass the Dental Hygiene National Board Examination and a Regional Practical Examination. A registered Dental Hygienist may practice dental hygiene in a city, county, or multi-county health department; private practice, hospital, long term care facility, or school; or in dental sales.

**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

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- A minimum standard composite score of 20 on the ACT assessment
- One year of biology
- One year of chemistry with a grade of C or better
- Grades of C or better in the science courses
- One year of algebra and advanced math or an 80 on the Accuplacer Test.
- Orientation before entering the program.
- Medical and dental examinations satisfactorily completed within three months before entering the program.
- Complete an American Heart Association Health Care Provider CPR course prior to program entry; maintain a current CPR status while enrolled in the program to comply with affiliating agency requirements.
- Two (2) or three (3) credits of post high school general nutrition with a grade of C or better.

Applications will be processed when requirements have been completed.

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

### CURRICULUM

The Dental Hygienist Associate Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 69 credits.

#### SUMMER SEMESTER

Course No.	Description	Credits
* 10-806-177	Gen Anatomy & Physiology	4
* 10-806-186	Intro to Biochemistry	3
<b>SEMESTER TOTAL</b>		<b>7</b>

#### FIRST SEMESTER

* 10-508-114	Dental Hygiene-Pre Clin	2
* 10-508-115	Dental Hygiene-Pre Clin/Lec	2
* 10-508-116	Histology/Embryology	1
* 10-508-117	Occupational Safety/Health	1
* 10-508-118	Anatomy-Head/Neck	3
* 10-806-197	Microbiology	4
<b>SEMESTER TOTAL</b>		<b>13</b>

#### SECOND SEMESTER

* 10-508-112	Radiography	3
* 10-508-113	Periodontology 1	1
* 10-508-120	Dental Hygiene 1-Clinic	2
* 10-508-121	Dental Materials	2
* 10-508-124	Dental Hygiene 1-Clinic/Lec	2
* 10-508-132	Pathology-General Oral	3
10-801-195	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

* 10-508-123	Periodontology 2	2
* 10-508-134	Dental Hygiene 2-Clinic	3
* 10-508-136	Dental Hygiene 2-Clinic/Lec	1
* 10-508-142	Dental Health-Community	2
10-801-196	Oral/Interpersonal Comm	3
* 10-806-185	Pharmacology	2
	Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

* 10-508-144	Dental Hygiene 3-Clinic	3
* 10-508-146	Dental Hygiene 3-Lecture	2
10-801-198	Speech	3
10-809-196	Intro to Sociology	3
10-809-198	Intro to Psychology	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Dental Hygiene National Board (10-508-172), Nutrition-Basic (10-303-180)

Students who have already completed A&P 1 and A&P 2 courses, for a total of 6 credits, will receive credit for taking those classes prior to the change.

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

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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.

**10-508-112 RADIOGRAPHY** ...radiographic techniques; principles of radiography with emphasis on radiation safety, radiobiology, darkroom techniques, anatomical landmarks, radiographic interpretation. (Prerequisites: 10-508-118, Anatomy-Head/Neck; 10-508-114, Dental Hygiene-Pre Clinical)

**10-508-113 PERIODONTOLOGY 1** ...anatomy, histology, physiology of the alveolar bone; periodontal ligament, gingiva, cementum; and evaluation of the periodontium in healthy and diseased state. (Prerequisite: 10-508-114, Dental Hygiene-Pre Clinical; Corequisite: 10-508-112, Radiography)

**10-508-114 DENTAL HYGIENE-PRE CLINIC/LAB** ...personal oral hygiene, operation and maintenance of dental equipment, infection control techniques, assessment of medical records, oral examination, instrumentation, polishing, and instrument sharpening. (Prerequisite: Accepted into the Dental Hygiene Program; 10-303-180, Nutrition-Basic or 10-510-101, Nutrition Pathways)

**10-508-115 DENTAL HYGIENE-PRE CLINIC/LECTURE** ...professional ethics, personal oral hygiene, operation and maintenance of dental equipment, infection control, medical records, oral examination, instrumentation, polishing, and instrument sharpening. (Prerequisite: Accepted into the Dental Hygiene Program; 10-303-180, Nutrition-Basic or 10-510-101, Nutrition Pathways)

**10-508-116 HISTOLOGY/EMBRYOLOGY** ...basic cell structures; embryologic development of the face and oral cavity; formation of teeth; bone eruption and exfoliation of teeth. (Prerequisite: Accepted into Dental Hygienist)

**10-508-117 OCCUPATIONAL SAFETY/HEALTH** ...prevention, recognition, and response to medical emergencies; occupational health and safety in accordance with OSHA mandates and CDC guidelines; epidemiology; prevention of transmissible diseases; and chemical hazard communication. (Prerequisites: 10-806-186, Introduction to Biochemistry; 10-806-177, Anatomy & Physiology I; Corequisite: 10-508-114, Dental Hygiene Pre-Clinic Lab; 10-508-115, Dental Hygiene Pre-Clinic Lecture)

**10-508-118 ANATOMY-HEAD/NECK** ...dental terminology; tooth development, function, and form; permanent and primary dentitions-individual tooth characteristics; occlusal classification; periodontium; oral cavity structure; musculature of the head and neck; bones of the skull; blood, nerve supply, and lymphatic system for the head and neck; dental charting. (Corequisites: 10-508-114, Dental Hygiene-Pre Clinical; 10-508-115, Dental Hygiene-Pre Clinical/Lecture; 10-508-116, Histology/Embryology)

**10-508-120 DENTAL HYGIENE 1-CLINIC** ...application and practice of exposure control; hazard communication; dental examinations; dental hygiene assessments; treatment planning, interventions, evaluations, and medical emergencies in the clinical setting. (Prerequisite: 10-508-114, Dental Hygiene-Pre Clinical)

**10-508-121 DENTAL MATERIALS** ...sources, properties, application, and manipulation techniques of dental materials; emphasis on characteristics of dental materials and their impact within the oral environment. (Prerequisites: 10-508-114, Dental Hygiene-Pre Clinical; 10-508-117, Occupational Safety/Health)

**10-508-123 PERIODONTOLOGY 2** ...examination, planning, implementation, and evaluation of client periodontal status; approach to therapy, maintenance, and epidemiology of periodontal disease; emphasis on the relationship of periodontics to the practice of dental hygiene. (Prerequisite: 10-508-113, Periodontology 1)

**10-508-124 DENTAL HYGIENE 1-CLINIC/LECTURE** ...treatment planning, caries process, fluoride therapy, sonic/ultrasonic scaling, oral health maintenance and disease control, air-brasive polishing, tooth hypersensitivity, pedodontic dental care, and dental hygiene history. (Prerequisite: 10-508-115, Dental Hygiene-Pre Clinical/Lecture)

**10-508-132 PATHOLOGY-GENERAL ORAL** ...nature of disease, variants of normal; inflammation; immunity, regeneration, and repair; developmental disorders; cysts, neoplasia, genetic disorders; and oral manifestations of systemic diseases. (Prerequisite: 10-508-114, Dental Hygiene Pre-Clinical; Corequisite: 10-508-120, Dental Hygiene 1-Clinical)

**10-508-134 DENTAL HYGIENE 2-CLINIC** ...application of assessments, treatment, and prevention planning; advanced clinical skills including root surface debridement, ultrasonic scaling, and radiographic techniques; patient counseling techniques; special needs patients. (Prerequisite: 10-508-120, Dental Hygiene 1-Clinical; 10-508-113, Periodontology 1)

**10-508-136 DENTAL HYGIENE 2-CLINIC/LECTURE** ...theory of establishing patient relationships, patient counseling techniques, behavioral change strategies, designing a personalized prevention plan, smoking cessation, dental hygiene care for special needs patients. (Prerequisites: 10-508-113, Periodontology 1; 10-508-120, Dental Hygiene 1-Clinical)

**10-508-142 DENTAL HEALTH-COMMUNITY** ...principles of public health dentistry relevant to current issues; student participation in assessment, planning, implementation, and appraisal of community dental health programs. (Prerequisite: 10-508-120, Dental Hygiene 1-Clinical)

**10-508-144 DENTAL HYGIENE 3-CLINIC** ...advanced instrumentation, administration of local anesthetic with instructor supervision, time management skills, preparation for the CRDTS Practical Exam. (Prerequisite: 10-508-134, Dental Hygiene 2-Clinical)

**10-508-146 DENTAL HYGIENE 3-LECTURE** ...dental specialties, legal relationships in dental hygiene practice, job interview preparation, nitrous oxide/ oxygen sedation technique, preparation for State Certification Exam, temporomandibular dysfunction, implant client, modified ultrasonics, geriatric dental hygiene. (Prerequisite: 10-508-136, Dental Hygiene 2-Clinical/ Lecture)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Diagnostic Medical Sonography

PROGRAM CODE 105262

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll-free: (800) 422-NWTC.

### 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.

Graduates of the Diagnostic Medical Sonography - Associate Degree Program will be able to:

- Apply knowledge of anatomy, physiology, positioning, and sonographic techniques to accurately demonstrate anatomical structures.
- Evaluate sonographic images for appropriate positioning and image quality.
- Exercise independent judgment and discretion in the technical performance of medical imaging procedures.
- Anticipate and provide patient comfort and safety through effective communication, interpersonal relationships, and application of body mechanics.
- Modify sonographic procedures to meet specific patient conditions.
- Function as a member of a health care system through effective procedures.
- Recognize emergency patient conditions and initiate basic life support procedures.
- Evaluate the performance of Sonography systems using quality assurance procedures and report malfunctions to proper authorities.
- Participate in career and socioeconomic opportunities available in sonographic technology through membership in professional organizations and continuing education.

Students will be required to purchase a nametag, provide their own transportation to clinical facilities, pay for liability insurance for each clinical course, and cover any other expenses related to their fieldwork experiences.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

All students are required to complete an American Heart Association Health Care Provider CPR course and are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.

**NOTE:** A student who does not meet the above requirements should consult with an NWTC counselor about ways to meet deficiencies through testing or course work.

### 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, technical advisors, etc.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalency

### Evidence of successful completion of the following high school courses, or their equivalents, are required prior to acceptance into the program:

- Biology - two semesters of high school biology or one semester of postsecondary biology with a grade of "C" or better.
- Algebra - two semesters of high school algebra or one semester of postsecondary algebra with a grade of "C" or better.
- Physics - one semester of high school physics with a grade of "C" or better.
- Communication - two semesters of high school communication coursework or one semester of postsecondary work with a grade of "C" or better.
- All students are expected to have entry-level computer skills. If a candidate is unsure of their skills, the learning center basic computer skills coursework is recommended (self-choice).
- Upon invitation, must write the Accuplacer test. ACT scores may be accepted in place of the Accuplacer (students with an overall score of 20 or higher, along with acceptable ACT scores in Math, Reading, and English, will not be required to write the Accuplacer).
- Completion of a physical examination.
- Prior to admission, students may need to demonstrate their ability to meet the technical standards of the profession as defined by the Society of Diagnostic Medical Sonographers.

### MATH LEVEL

Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Diagnostic Medical Sonography students must fulfill this requirement.

### CURRICULUM

The Diagnostic Medical Sonography program is a two-year, two-summer, six-semester program. Upon graduation, a student will have completed 70 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-526-172	DMS-Patient Care/Ethics	2
10-801-195	Communication-Written	3
10-801-196	Oral/Interpersonal Comm OR	3
10-801-198	Speech	3
10-806-177	Gen Anatomy & Physiology	4
10-809-195	Economics	3
10-809-198	Intro to Psychology	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-501-101	Medical Terminology	3
* 10-526-110	DMS-Sonography Physics/Inst 1	3
* 10-526-130	DMS-Introduction	2
* 10-526-141	DMS-Clinical Education 1	1
* 10-526-142	DMS-Clinical Education 2	2
* 10-526-161	DMS-Abdomen/Small Parts 1	2
10-806-179	Adv Anatomy & Physiology	4
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

* 10-526-143	DMS-Clinical Education 3	2
* 10-526-147	DMS-Cross-Sectional Anatomy Elective	3
<b>SEMESTER TOTAL</b>		<b>7</b>

#### FOURTH SEMESTER

* 10-526-111	DMS-Sonography Physics/Inst 2	3
* 10-526-131	DMS-OB/GYN 1	2
* 10-526-132	DMS-OB/GYN 2	2
* 10-526-144	DMS-Clinical Education 4	2
* 10-526-162	DMS-Abdomen/Small Parts 2 Elective	3
<b>SEMESTER TOTAL</b>		<b>14</b>

#### FIFTH SEMESTER

* 10-526-133	DMS-OB/GYN 3	2
* 10-526-145	DMS-Clinical Education 5	2
* 10-526-163	DMS-Abdomen/Small Parts 3	2
* 10-526-164	DMS-Cardiac/Vasc Intro	3
10-809-196	Intro to Sociology	3
<b>SEMESTER TOTAL</b>		<b>12</b>

#### SIXTH SEMESTER

* 10-526-146	DMS-Clinical Education 6	1
* 10-526-165	DMS-Ultrasound Registry Review	1
<b>SEMESTER TOTAL</b>		<b>2</b>

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

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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.

### **10-526-110 DMS-SONOGRAPHY**

**PHYSICS/INSTRUMENTATION 1** ...introduction to Sonography physics and instrumentation including the nature and types of sound waves, propagation of ultrasound through tissues, ultrasound transducers, and pulse-echo instruments. (Prerequisites: 10-806-177, General Anatomy & Physiology; 10-526-172, DMS-Patient Care & Ethics)

**10-526-111 DMS-SONOGRAPHY PHYSICS/ INSTRUMENTATION 2** ...continuation of sonography physics including image acquisition and display methods, resolution, artifacts, Doppler instrumentation, safety and quality control. (Prerequisite: 10-526-110, DMS-Sonography Physics/Instrumentation 1)

**10-526-130 DMS-INTRODUCTION** ...introduction to the fundamental principles of ultrasound including history, applications, indications, equipment, and positioning techniques. Role and responsibilities of the Diagnostic Medical Sonographer included. (Prerequisite: 10-526-172, DMS-Patient Care & Ethics)

**10-526-131 DMS-OBSTETRICS/GYNECOLOGY 1** ...sonographic techniques related to the anatomy and pathology of the pelvis, female reproductive system, early intrauterine, and ectopic pregnancies. (Prerequisite: 10-806-179, Advanced Anatomy and Physiology; Corequisite: 10-526-111, DMS Sonography Physics Inst 2)

**10-526-132 DMS-OBSTETRICS/GYNECOLOGY 2** ...continuation of OB/GYN sonography including completion of the first trimester of pregnancy, and normal and abnormal fetal anatomy and physiology during the second and third trimesters of pregnancy. (Corequisite: 10-526-131, DMS-OB/GYN 1)

**10-526-133 DMS-OBSTETRICS/GYNECOLOGY 3** ...continuation of OB/GYN sonography in the second and third trimesters of pregnancy. Advanced techniques and topics to include maternal/fetal procedures. Specialty topics of OB care. (Prerequisite: 10-526-132, DMS-OB/GYN 2)

### **10-526-141 DMS-CLINICAL EDUCATION 1**

...introduction to Diagnostic Medical Sonography in the clinical setting. Application of didactic coursework in the general curriculum. May require student to travel. (Prerequisite: 10-526-172, DMS-Patient Care & Ethics)

### **10-526-142 DMS-CLINICAL EDUCATION 2**

...continuation of Diagnostic Medical Sonography clinical experience. Correlation and application of didactic coursework in the general curriculum. May require student to travel. (Corequisites: 10-526-141, DMS Clinical Education; 10-526-110, DMS Sonography Physics Inst 1)

### **10-526-143 DMS-CLINICAL EDUCATION 3**

...continuation of Diagnostic Medical Sonography clinical experience. Reinforcement and broadening of knowledge gained in Clinical Education 2 to correlate with program curriculum. May require student to travel. (Prerequisite: 10-526-142, DMS-Clinical Education 2)

### **10-526-144 DMS-CLINICAL EDUCATION 4**

...continuation of Diagnostic Medical Sonography clinical experience. Reinforcement and broadening of knowledge gained in Clinical Education 3 to correlate with program curriculum. May require student to travel. (Prerequisite: 10-526-143, DMS-Clinical Education 3)

### **10-526-145 DMS-CLINICAL EDUCATION 5**

...continuation of Diagnostic Medical Sonography clinical experience. Reinforcement and broadening of knowledge gained in Clinical Education 4 to correlate with program curriculum. May require student to travel. (Prerequisite: 10-526-144, DMS-Clinical Education 4)

### **10-526-146 DMS-CLINICAL EDUCATION 6**

...continuation of Diagnostic Medical Sonography clinical experience. Reinforcement and broadening of knowledge gained in Clinical Education 5 to correlate with program curriculum. May require student to travel. (Prerequisite: 10-526-145, DMS-Clinical Education 5)

### **10-526-147 DMS-CROSS-SECTIONAL ANATOMY**

...introduction to cross-sectional anatomy as related to Diagnostic Medical Sonography. Includes correlating images from other imaging modalities. (Prerequisite: 10-806-179, Advanced Anatomy and Physiology)

### **10-526-161 DMS-ABDOMEN/SMALL PARTS 1**

...introduction to sonographic imaging and techniques related to the anatomy and pathology of the upper abdominal organs including the liver, gallbladder, pancreas, biliary tree, spleen and urinary tract. (Prerequisite: 10-806-177, General Anatomy & Physiology; Corequisite: 10-806-179, Advanced Anatomy & Physiology)

### **10-526-162 DMS-ABDOMEN/SMALL PARTS 2**

...continuation of abdominal sonography related to the gastrointestinal tract, adrenal glands, abdominal wall, peritoneum, diaphragm and fluid collections. Introduction of abdominal Doppler techniques included. (Prerequisite: 10-526-161, DMS-Abdomen/Small Parts 1)

### **10-526-163 DMS-ABDOMEN/SMALL PARTS 3**

...continuation of abdominal sonography including advanced Doppler techniques and invasive procedures. Techniques related to small parts anatomy, pathology, and imaging also covered. (Prerequisite: 10-526-162, DMS-Abdomen/Small Parts 2)

### **10-526-164 DMS-CARDIAC/VASCULAR IMAGING**

**INTRODUCTION** ...introduction to sonographic techniques used to evaluate the anatomy, physiology and pathology of the heart and the peripheral vascular system with specific attention to examination of the carotid arteries. (Prerequisite: Accepted into Diagnostic Medical Sonography or permission of program faculty)

### **10-526-165 DMS-ULTRASOUND REGISTRY**

**REVIEW** ...comprehensive review of program material to prepare for the national certification exams to include simulated testing environments. (Prerequisites: 10-526-163, DMS-Abdomen/Small Parts 3; 10-526-133, DMS-Obstetrics/Gynecology 3; 10-526-111, DMS-Sonography/Physics Inst 2)

### **10-526-172 DMS-PATIENT CARE/ETHICS**

...introduction to the principles of patient in the imaging environment including medical history, patient assessment, monitoring, handline, transporting, and the patient as a person. Legal and ethical issues included. (Corequisite: 10-806-177, General Anatomy & Physiology)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Diesel and Heavy Equipment Technician Program Code 324121

## TECHNICAL DIPLOMA - TWO YEARS

Offered at the Sturgeon Bay campus. Admissions, registration, counselor, or course information: (920) 746-4900. Toll free: (800) 422-NWTC, Ext. 4900.

### 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.

Graduates of this program will be able to:

- 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 preventive maintenance.
- Use welding and machine tools.
- 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

Students should have mastered basic math skills. For a description of Basic Math, see the Basic Education section of this catalog.

**NOTE:** The Caterpillar Foundation selected this technical program for participation in its Dealer Excellence Fund. Funds from Caterpillar and a matching grant from FABCO Equipment are used for student scholarships, staff development, curriculum development, and instructional equipment.

### EMPLOYMENT POTENTIAL

The Diesel and Heavy Equipment Technician is employed in a variety of work environments. These include heavy equipment, truck, agriculture, marine, engine rebuilding, and specialty shops.

A graduate of the program will have the potential for employment as Construction Equipment Technician, Engine Technician, Farm Equipment Technician, Fuel Injection Technician, Service Technician, or Truck Driver/Diesel Technician.

#### 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

### 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

Course No.	Description	Credits
10-103-111	Micro: Windows-Introduction	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
31-804-301	Math 1-Trades	2
32-442-352	Welding-Metal Working Proc	2
<b>SEMESTER TOTAL</b>		<b>16</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
32-806-353	Science-Mechanics	2
<b>SEMESTER TOTAL</b>		<b>16</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
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
31-809-301	Social Science Survey	2
<b>SEMESTER TOTAL</b>		<b>16</b>

**NOTE \*** A 3 to 5 page paper or speciality assignments are required for courses applied to an associate degree. Individual instructor requirements will be reviewed at program orientation and listed in each course syllabi.

This program is fully eligible for financial aid.

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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.

### 10-412-100 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 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Diesel Equipment Technology Program Code 104121

## ASSOCIATE DEGREE - TWO YEARS

*Pending State Board Approval*

Offered at the Sturgeon Bay campus. Admissions, registration, counselor, or course information: (920) 746-4900. Toll free: (800) 422-NWTC, Ext. 4900.

### 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.

Graduates of this program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High School background in math, science and technology education would be beneficial

### MATH LEVEL

Students should have mastered basic math skills.

For a description of basic math, see the Basic Education section of this catalog.

**NOTE:** The Caterpillar Foundation selected this technical program for participation in its Dealer Excellence Fund. Funds from Caterpillar and a matching grant from FABCO Equipment are used for student scholarships, staff development, curriculum development, and instructional equipment.

### EMPLOYMENT POTENTIAL

The Diesel and Heavy Equipment Technology graduate is employed in a variety of work environments. These include heavy equipment, truck, agriculture, marine, engine systems and specialty shops.

A graduate of the program will have the potential for employment as a Diesel and Heavy Equipment Technician, Related Specialist Technician, Related Parts Support Manager, Industry Related Service Manager-Supervisor, Industry Related Sales Representative, Business Owner or Educational Trainer.

### 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.

**PARTS SUPPORT MANAGER:** Manages a parts department within a repair facility.

**SERVICE MANAGER-SUPERVISOR:** manages technician performance, directs work flow, tracks work progress, coordinates service business profitability, reports to Operations level management.

**INDUSTRY RELATED SALES:** 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 two-year baccalaureate college, a graduate could pursue a four-year degree in secondary, post-secondary or industry technical training.

### Recommended off campus work experiences, 20 hours in each area:

- Diesel and Heavy Equipment Service Writer
- Diesel and Heavy Equipment Service Manager
- Diesel and Heavy Equipment Shop Foreman
- Diesel and Heavy Equipment Parts Manager
- Diesel and Heavy Equipment Warranty Claims Person
- Diesel and Heavy Equipment Service Department Manager
- Diesel and Heavy Equipment Human Relations Manager
- Other areas with instructor's approval

### CURRICULUM

The Diesel and Heavy Equipment Technology Associate Degree is a two-year, four-semester program offered at the Sturgeon Bay campus. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-804-120	Math-Tech Algebra	3
10-801-195	Written Communications	3
10-412-100	Diesel-Lab Operations Tech.	1
10-602-118	DC Elec Technology	1
10-412-112	Diesel Electric Systems Tech. I	3
10-412-108	Internal Comb Eng Tech. Intro	1
10-412-109	Diesel Engine Svc Fund Tech.	5
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-412-20	Diesel-Chassis/Suspension Tech.	4
10-412-121	Diesel-Brake Systems Tech.	3
10-412-122	Diesel Preventive Mainten	4
10-412-123	Diesel Electrical Systems Tech. II	3
10-801-196	Oral/Interpersonal Communications	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

10-419-170	Hydraulics-Applied	3
10-412-124	Diesel-Electric Engine Sy Tech.	1
10-412-134	Diesel Engine Systems Tech.	4
10-809-197	Amer. Contep, Soc	3
10-412-137	Diesel-Schematic Interpre Tech.	2
10-806-131	Material Science	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

10-809-199	Psychology of Human Relations	3
10-801-197	Technical Reporting	3
10-412-140	Diesel Engine Troubleshoo Tech.	4
10-412-141	Diesel-Power Trains Tech.	5
10-412-145	Diesel-Refrigeration/Air Tech.	3
<b>SEMESTER TOTAL</b>		<b>18</b>

**NOTE:** A 3 to 5 page paper or specialty assignments are required for courses applied to an associate degree. Individual instructor requirements will be reviewed at program orientation and listed in each course syllabi.

This program is fully eligible for financial aid.

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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.

### **10-412-100 DIESEL LAB OPERATIONS**

**TECHNOLOGY** ...diesel shop safety, basic equipment operation, rigging and lifting, hand and power precision tools, fasteners and hazard material handling procedures.

### **10-412-112 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.

### **10-412-108 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.

### **10-412-120 DIESEL-CHASSIS/SUSP/STEER**

**TECHNOLOGY** ...vehicular steering systems, heavy-duty axles, suspension systems, wheels and tires, coupling systems

### **10-412-121 DIESEL-BRAKE SYSTEMS**

**TECHNOLOGY** ...braking systems, drum brake principles, disc brakes, foundation brake systems, air brakes, anti-lock systems.

### **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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **10-419-169 HYDRAULICS TECHNOLOGY**

...will cover the following but not limited to hydraulics principles, system schematics and symbols, pumps, valves, cylinders, motors, accumulators, filters, reservoirs, hydraulic seals, fluids, maintenance, and safety rules.

Descriptions of courses not found on this page can be found in the back of the catalog.

# E-Business Technology Specialist

PROGRAM CODE 101524

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

The E-Business Technology Specialist program prepares students to integrate web technologies to support internet-based business systems using concepts in database integration, programming, graphics, marketing, logistics, security, and networking. This flexible degree program is best suited for an individual with sufficient work experience to enable selection of the two clusters that match career interest and organizational need.

After admission, each learner is required to complete a program planner indicating clusters selected and outlining a tentative course completion timeline. This plan will be reviewed and approved by a counselor before enrolling in courses.

All graduates of this program will be able to:

- Communicate effectively.
- State and solve technical problems.
- Describe the natural world.
- Interact within society.
- Demonstrate an understanding of business models and organizational functions necessary to conduct business in a changing environment.
- Analyze accounting information and relate it to business decisions.
- Effectively apply business math models when analyzing and solving problems.
- Use project management techniques.

Graduates selecting the **MICROCOMPUTER SPECIALIST** cluster will also be able to:

- Design customized spreadsheets, documents, and relational databases.
- Use macros, object linking, and programming techniques to automate applications.
- Identify and configure hardware components of a microcomputer.

Graduates selecting the **MICROCOMPUTER PROGRAMMER** cluster will also be able to:

- Create, edit, run, and debug programs in four languages: Java, Visual Basic, C++, SQL.
- Solve business problems using programming techniques.

Graduates selecting the **E-COMMERCE** cluster will also be able to:

- Understand the business models underlying electronic commerce.
- Effectively research business and consumer markets to create electronic business marketing strategies.
- Develop an electronic commerce marketing plan.

Graduates selecting the **WEB GRAPHIC DESIGN** cluster will also be able to:

- Modify graphics and restructure information to the protocols and formats of the internet.
- Fulfill graphic design goals.
- Implement information architecture.
- Test usability of interface design.

Graduates selecting the **NETWORK SECURITY** cluster will also be able to:

- Design, implement, and maintain a secure network environment.
- Assess the impact of emerging technologies.

Graduates selecting the **WEB DATABASE INTEGRATOR** cluster will also be able to:

- Develop, build, and configure a web application to work with an application server.
- Create a database design and effective interface to support a web application.

### REQUIREMENTS FOR PROGRAM ENTRY:

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- One year of high school algebra or equivalency
- Computer familiarity and ability to use a keyboard and mouse

### MATH LEVEL

Students should have mastered basic math and algebra skills. For a description of basic math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

Program graduates may work in a variety of areas of an organization depending upon their selection of course clusters. A graduate of the program will have the potential for employment as Web Developer, E-Business Developer/E-Commerce Specialist, Web Technical Support, Web Analyst/E-Business Analyst, Web Programmer, and Consultant. Some positions may require additional education and/or work experience.

**WEB DEVELOPER:** designs, implements, and maintains intranet and internet web applications/sites.

**E-BUSINESS DEVELOPER/E-COMMERCE 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.

**WEB PROGRAMMER:** develops software code for web-based applications.

**CONSULTANT:** work with clients to improve the efficiency and effectiveness of the e-business infrastructure.

## 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 clusters 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 69 credits.

### ALL STUDENTS COMPLETE:

Course No.	Description	Credits
10-101-102	Accounting-Intro	3
10-102-158	Business-Intro	3
	OR	
10-102-182	Business Operations	3
10-152-100	E-Business Tech Internship	3
	OR	
10-152-101	E-Business Field Study	3
10-801-195	Communication-Written	3
	OR	
10-801-197	Reporting-Technical	3
10-801-196	Oral/Interpers Communication	3
10-804-151	Math-Data Proc Logic	3
	OR	
10-804-149	Math-Process	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
10-809-199	Psychology-Human Rel	3
	Elective	3
	Elective	3
	<b>TOTAL CREDITS</b>	<b>33</b>

### STUDENTS SELECT TWO OF THE FOLLOWING COURSE CLUSTERS:

#### MICROCOMPUTER SPECIALIST

10-107-160	Micro Software - Intro	3
10-107-162	Micro Hardware/Troubleshoot-Intro	4
10-107-171	Micro Software - Integration/Auto	3
10-107-172	Micro Program-Visual Basic	4
	OR	
10-107-182	Micro Operating Systems*	4
	<i>*Operating Systems is required for students also selecting the Micro Programming certificate as their second option. Students selecting any other certificate as their second option are required to take Visual Basic.</i>	
10-107-181	Micro Database Development	4
	<b>TOTAL CREDITS</b>	<b>18</b>

#### MICROCOMPUTER PROGRAMMER

10-107-100	Computer: Programming-Intro*	1
10-107-101	Computer: Java-Intro	3
10-107-102	Computer: VisualBASIC-Intro*	3
10-107-109	Computer: Programming Project	2
10-107-140	Computer: Program 4-4GL	3
10-107-173	Micro Programming C++	3
10-107-175	Computer: VisualBASIC-Adv	3
	<i>*10-107-172 Micro Program-Visual Basic, 4 credit, may be taken in lieu of these two courses.</i>	
	<b>TOTAL CREDITS</b>	<b>18</b>
	<b>E-COMMERCE</b>	
10-104-112	E-Commerce Implement Plan	3
10-104-115	E-Commerce Online Strategies	3
	OR	
10-104-198	Market Research	3
10-104-116	E-Commerce Database Mktg	3
10-104-118	E-Commerce Principles	3
10-104-119	E-Commerce Web Marketing	
	OR	
10-104-143	Marketing-Direct	3
10-182-130	E-Commerce Logistics/Fulfill	3
	<b>TOTAL CREDITS</b>	<b>18</b>

#### WEB GRAPHIC DESIGN

10-111-101	Macintosh-Image Editing	3
10-111-150	Web Graphic Design	3
10-111-151	Website Design	3
10-111-152	Web Animation Design	3
10-111-154	Macintosh-Multimedia Authoring	3
10-111-161	Macintosh Illustration	3
	<b>TOTAL CREDITS</b>	<b>18</b>

#### NETWORK SECURITY

10-107-144	Information Tech-Emerging	2
10-107-145	Network: Security Fundamentals	3
10-107-146	Network: Firewall Install/Conf	4
10-107-163	Network: Structures 1	3
10-107-168	Network: Structures 2	3
10-107-169	Network: Incident Reporting	3
	<b>TOTAL CREDITS</b>	<b>18</b>

#### WEB DATABASE INTEGRATOR

10-107-124	Web: Connectivity	3
10-107-125	Web: Database Development	3
10-107-126	Web: Database Administration	3
10-107-127	Web: Application Security	3
10-107-128	Web: Server Side Script-Unix	3
10-107-129	Web: Server Side Scripting-MS	3
	<b>TOTAL CREDITS</b>	<b>18</b>

\*Students choosing the Network Security cluster should have basic network administration experience using Microsoft and UNIX based operating systems.

**SUGGESTED ELECTIVES:** Depends on cluster selection. Consult with a counselor for recommendations.

This program is fully eligible for financial aid.

# E-Business Technology Specialist (cont.)

## COURSE DESCRIPTIONS

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

### 10-104-112 E-COMMERCE IMPLEMENTATION

**PLAN** ...implementation plan for a new E-Commerce initiative or E-Commerce business. Included is analyzing the market need, product development, operational planning; including outsourcing, competitive analysis, financial need forecasting, and risk assessment.

### 10-104-115 E-COMMERCE ONLINE SEARCH

**STRATEGIES** ...use of essential electronic information sources (library catalogs, business databases, government resources, CD-ROM, commercial databases, World Wide Web) useful for marketing and business decision-making.

### 10-104-116 E-COMMERCE 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.

**10-104-118 E-COMMERCE PRINCIPLES** ...how the Internet and the Web dramatically impact consumers and organizations carry out the marketing function.

### 10-104-119 E-COMMERCE 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.

**10-104-143 MARKETING-DIRECT** ...interactive technology, direct marketing vs. general advertising, market segmentation through databases, renting prospect lists, print and broadcast media copy, direct mail, catalogs, telemarketing skills, and script writing.

**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.

**10-107-100 COMPUTER: PROGRAMMING-INTRODUCTION** ...basic techniques for developing computer programs to solve common business problems; includes logic, structure, flowcharting, comparing, looping, control breaks, variables, arrays, internal data representation, file processing, and testing procedures.

### 10-107-101 COMPUTER: JAVA-INTRODUCTION

...write object-oriented programs with graphical user interfaces in Java; Basics, Data and Information Processing, Object-Oriented Programming, Graphical User Interfaces and Event-Driven Programming, Graphics and Networking.

### 10-107-102 COMPUTER: VISUALBASIC-INTRODUCTION

...program definition and design, form design, coding, testing, debugging, interactive programs, sequential and random access files, and an introduction to data structures.

### 10-107-109 COMPUTER: PROGRAMMING

**PROJECT** ...development of a major programming project in business. Project requirements and programming language subject to approval by the instructor. Student works independently with the instructor to obtain technical consultation and mentoring.

**10-107-124 WEB: CONNECTIVITY** ...dynamic web sites, visual design, user interactivity, database components, SQL queries, administrator and developer roles, script interactivity between web pages and databases, networking concepts, tracking, security.

### 10-107-125 WEB: DATABASE DEVELOPMENT

...web database uses, analyzing information requirements, file organizations, data models, entity relationships, normalizing data, database management systems, development environments, web connectivity, creating tables, writing queries and file maintenance using SQL.

### 10-107-126 WEB: DATABASE ADMINISTRATION

...database administration in relation to web-based availability of data, including data dictionary creation; data warehousing; distributed databases; data modeling standards; data migration; disaster planning; records management, archival, destruction, capacity planning. (Prerequisite: 10-107-125, Web:Database Analysis & Design)

### 10-107-127 WEB: APPLICATION SECURITY

...operating system installation, update, configuration for the web environment including: Apache configuration, SSL configuration, file encryption using PGP, digital certificates, secure sheet, and virtual private networks.

### 10-107-128 WEB: SERVER SIDE SCRIPTING-

**UNIX** ...operating system installation, update, configuration for the web environment including: Apache configuration, PERL configuration, basic and intermediate HTML, basic and intermediate PERL, and manipulating ODBC compliant databases using PERL.

### 10-107-129 WEB: SERVER SIDE SCRIPTING-

**MICROSOFT** ...operating system installation, update, configuration for the web environment including: IIS configuration, Active Server Page (ASP) configuration, basic and intermediate HTML, basic/intermediate ASP, manipulating ODBC compliant databases using ASP.

### 10-107-140 COMPUTER: PROGRAMMING 4-4GL

...application system development using a fourth generation language, table creation/maintenance, screen designing, interactive program development, report programming/generating, menu designing/ programming, and trigger processing. Requires three semesters of programming, one of which is advanced. (Prerequisites: 10-107-123, Computer: Database Concepts)

### 10-107-144 INFORMATION TECHNOLOGIES-

**EMERGING** ...current issues and trends in the computer science area; possible topics: the Internet, visual programming, multimedia, computer security and ethics, and client/server.

### 10-107-145 NETWORK: SECURITY

**FUNDAMENTALS** ...network security fundamentals to include desktop and server systems.

### 10-107-146 NETWORK: FIREWALL

**INSTALLATION/CONFIGURATION** ...installation and configuration of several firewall types.

### 10-107-160 MICRO SOFTWARE-INTRODUCTION

...mouse techniques, file/program management using Windows, formatting documents using Word to include tables/mail merge, creating slide shows using PowerPoint to include graphics/animation, and generating spreadsheets using Excel to include charts/macros.

### 10-107-162 MICRO HARDWARE/

**TROUBLESHOOTING-INTRO** ...computer terminology, component identification, POST, maintenance procedures, system boards, memory, binary and hexadecimal number systems, disk drives, FAT, operating systems, installations and configurations, internet research, troubleshooting and networking. Includes DOS exposure.

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**10-107-163 NETWORK: STRUCTURES 1** ...cable characteristics and termination, structured cabling systems, OSI reference model, IP addressing and subnetting, address resolution protocol, network architectures, basic router configuration, and routing information protocol.

**10-107-168 NETWORK: STRUCTURES 2** ...configuring routing protocols, access control lists, broadcast and collision domains, Ethernet switches, VLANs, serial protocols, WAN services, protocol analysis, cellular communications, and Internet access alternatives. (Prerequisite: 10-107-163, Network: Structures 1)

**10-107-169 NETWORK: INCIDENT REPORTING** ...incident response, network surveillance, response strategies, forensic process, initial response to Windows and Unix. Investigation of Windows and Unix systems, routers, web attacks, applications servers, security/forensic tools. Requires Unix/ Windows familiarity. (Prerequisites: 10-107-163, Network Structures 1 and 10-107-168, Network Structures 2)

**10-107-171 MICRO SOFTWARE-INTEGRATION AND AUTOMATION** ...coverage of the integration of Microsoft Office applications. This will include DDE, OLE, fundamental programming constructs, the Office Object Model, and VBA. VBA constructions will be used to automate OLE. (Prerequisite: 10-107-160, Micro Software-Intro)

**10-107-172 MICRO PROGRAMMING-VISUAL BASIC** ...program definition and design, form design, coding, testing, debugging, interactive programs, sequential and random access files, and an introduction to data structures. (Prerequisite: 10-107-170, Micro Software 2-Integration)

**10-107-173 MICRO PROGRAMMING C++** ...C++ integrated development environment to construct programs, data types, control structures; library and user defined functions; disk I/O; and dynamic memory allocation.

**10-107-175 COMPUTER: VISUAL BASIC-ADVANCED** ...a survey of topics related to database access. Windows common controls, multiple document interface programming, Windows APIs, component-based applications, object-oriented programming, ActiveX controls, HTML Help, and program deployment and maintenance. (Prerequisite: 10-107-172, Micro Program-VisualBASIC or 10-107-102, Computer: VisualBASIC-Intro or a course in any programming language that includes interactive programming and file processing)

**10-107-181 MICRO DATABASE DEVELOPMENT** ...database management and application development including design, automation, and use of relational database management systems using Microsoft Access. (Prerequisite: 10-107-171, Micro Software-Integration and Automation)

**10-107-182 MICROCOMPUTER OPERATING SYSTEMS** ...creation of microcomputer systems: single machine systems including advanced MS-DOS commands and Windows and multi-user systems including Novell Netware and Unix. (Prerequisite: 10-107-162, Micro Hardware)

**10-111-101 MACINTOSH-IMAGE EDITING** ...explore the software application of Adobe Photoshop; scanning, editing, color correcting, and creating composite montage photographs. Prepare images for publication in print or on the internet. An introduction to manipulating bitmap images.

**10-111-150 WEB GRAPHIC DESIGN** ...(Adobe ImageReady+Acrobat) internet protocols, website navigation, information architecture and page structure, interface design, optimizing web graphics, GIF animation, prototyping interfaces, and testing browser compatibility. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-101, Macintosh-Image Editing)

**10-111-151 WEBSITE DESIGN** ...(Adobe Go-Live +Acrobat) format text for websites, build DHTML animation, internet based forms, cascading style sheets, CSS, web publishing, browser testing, and basic site management. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-150, Web Graphic Design)

**10-111-152 WEB ANIMATION DESIGN** ...(Macromedia 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. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-101, Macintosh-Image Editing)

**10-111-154 MACINTOSH-MULTIMEDIA AUTHORIZING** ...(QuickTime, iMovie, Final Cut Pro) explore non-linear digital video editing, DV camera operations and audio development and processing. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-101, Macintosh-Image Editing)

**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.

**10-182-130 E-COMMERCE LOGISTICS/ FULFILLMENT** ...e-commerce, business-to-business e-commerce, consumer e-commerce, e-commerce distribution, e-procurement, e-commerce connection, legal and ethical issues, and e-commerce logistics applications.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Early Childhood Education

PROGRAM CODE 103071

## ASSOCIATE DEGREE - TWO YEARS

Offered online. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-6866

### 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-age 12. It is designed to provide students with the skills and knowledge necessary in the field of child development.

Graduates of the Early Childhood Education Program will be prepared to:

- Develop and implement curriculum for young children.
- Design developmentally appropriate learning materials.
- Organize learning environments based upon the needs of young children.
- Understand and apply knowledge of child development and how children learn.
- Maintain and promote safe and healthy play environments.
- Value a diverse culture, model awareness, practice sensitivity and respect the backgrounds of children and their families.
- Work cooperatively with other staff members, parents, and community resource people.
- Understand and adhere to licensing regulations applicable to the industry.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information. Students must have:

- An interview or orientation prior to being accepted into the program
- A high school diploma or equivalency
- Demonstrated proficiency in basic skills through a course placement assessment
- Proper immunizations
- High school grade average of C or above grade requirement
- All students are required to complete 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.

### MATH LEVEL

Students should have 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 ABOVE REQUIREMENTS is required to consult an NWTC counselor about ways to make up any deficiencies through testing or course work.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [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 an Early Childhood Teacher in a group center, Family Childcare Provider—Teacher - Owner, Nanny, Head Start Teacher, Pre-Kindergarten Assistant Teacher at a Public/Private School, Child Care Center Supervisor/Manager, Assistant Director of an Early Childhood Program, Early Childhood Program Director, Child Care Center Administrator, and Owner of Childcare Center.

### 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, and guided activities.

### 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, providing customer service, and all human resource functions such as: hiring/firing, supervision, training, and evaluation of staff.

### FAMILY CHILDCARE PROVIDER/TEACHER/OWNER:

plans and implements comprehensive program for the child's total development with concern for child's health, safety, and welfare in a family/home environment.

### FUTURE OPPORTUNITIES:

NWTC has formal program-to-program transfer agreements with the University of Wisconsin-Milwaukee, University of Wisconsin-Whitewater, and University of Wisconsin-Parkside, which will give graduates an opportunity to obtain their baccalaureate degree.

### CURRICULUM

The Early Childhood Education Associate Degree Program is a two-year program. Upon graduation, a student will have completed 70 credits. Courses are offered online.

Course No.	Description	Credits
<b>Take these classes in any order:</b>		
10-307-103	Childhood-Early Intro	3
10-307-104	Child Growth/Development 1	3
10-307-105	Child-Health/Safety/Nutrition	3
* 10-307-116	Creative Learning Activities 1	3
10-307-119	Child Behavior Guiding	3
10-307-112	Infant Toddler Caregivers	3
10-307-132	Children-Differing Abilities	3

### These classes have prerequisites. Take as directed.

** 10-307-117	Childhood Early Practicum 1	3
10-307-118	Childhood Early Seminar 1	1
** 10-307-122	Childhood Early Practicum 2	3
10-307-123	Childhood Early Seminar 2	1
** 10-307-130	Childhood Early Practicum 3	3
10-307-131	Childhood Early Seminar 3	1
** 10-307-135	Childhood Early Practicum 4	3
10-307-136	Childhood Early Seminar 4	1
10-307-120	Childhood Early Growth/Dev 2	3
* 10-307-121	Creative Learning Activities 2	3
10-307-133	Childhood Admin Early Education	3

### General Studies Classes—Take in any order

10-801-195	Communication-Written	3
10-801-196	Oral/Interpersonal Communication	3
10-809-198	Psychology	3
10-809-196	Sociology-Intro	3
10-804-101	Math-Business	3
10-809-195	Economics	3

### Elective Credits - Your Choice 6

\* Classes will require two Saturday visits to the Green Bay campus unless other arrangements have been made.

\*\* Required: Student teaching in the community.

For further details, call (920) 498-6373.

**NOTE:** It is necessary to show good health as evidenced by a medical examination within three months prior to beginning practicum class.

This program is fully eligible for financial aid.

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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.

### **10-307-104 CHILD GROWTH/DEVELOPMENT 1**

...child growth and development theories; analyze growth and development of children; domains of development; social, cultural, and economic influences on child development.

### **10-307-105 CHILD-HEALTH/SAFETY/**

**NUTRITION** ...legal and ethical responsibilities of early childhood education professionals in providing for the health, safety and nutrition of young children; governmental regulations; safety of indoor and outdoor environments; universal precautions for routine care for children; emergency situations; health assessments; healthy food habits.

### **10-307-116 CREATIVE LEARNING ACTIVITIES**

**CURRICULUM 1** ...creative learning activities; diversity and developmentally appropriate, bias-free curriculum including literature, music, art, and small and large muscle activities; techniques for teacher-made materials.

### **10-307-117 CHILDHOOD-EARLY PRACTICUM 1**

...student teaching experience working with young children care setting; observe and record children's behavior, integrate anti-bias strategies and develop learning plans to facilitate children's play. (Prerequisites: 10-307-104, Child Growth and Development 1 and 10-307-105, Child-Health/Safety/Nutrition)

### **10-307-118 CHILDHOOD-EARLY SEMINAR 1**

...introduction to the early childhood classroom; investigate strategies and skills before entering the classroom. Discuss and problem solve with fellow classmates; analyze teaching/learning practices. (Corequisite: 10-307-117, Childhood-Early Practicum 1)

### **10-307-120 CHILDHOOD-EARLY GROWTH/**

**DEVELOPMENT 2** ...physical, social, emotional, and cognitive domains of the infant, preschool child, and school-age child; developmental milestones and developmental issues; application to the early childhood classroom. (Prerequisite: 10-307-104, Child Growth/Development 1)

### **10-307-121 CREATIVE LEARNING ACTIVITIES**

**CURRICULUM 2** ...continuum of Creative Learning Activities Curriculum 1; explore a wide variety of creative learning activities in all developmental domains; plan developmentally appropriate, bias-free curriculum for young children. (Prerequisite: 10-307-116, Creative Lrng Act Curr 1)

### **10-307-122 CHILDHOOD-EARLY PRACTICUM 2**

...higher-level skills for observing and recording children's behavior, integrate anti-bias strategies and develop learning plans to facilitate children's play by serving as a student teacher in an early childhood classroom; communication and involvement strategies, tools and skills to use when communicating with families. This learning occurs under the guidance of an experienced, cooperating teacher and an NWTC instructor. (Prerequisite: 10-307-117, Childhood-Early Practicum 1)

### **10-307-123 CHILDHOOD-EARLY SEMINAR 2**

...reinforces the learning and increased skill level the student teacher gains in the early childhood classroom; practice strategies and skills before entering the classroom. Discuss and problem solve with fellow classmates; analyze teaching/learning practices. (Corequisite: 10-307-122, Childhood-Early Practicum 2)

### **10-307-130 CHILDHOOD-EARLY PRACTICUM 3**

...higher-level skills for observing and recording children's behavior, integrate anti-bias strategies and develop learning plans to facilitate children's play by serving as a student teacher in an early childhood classroom; communication and involvement strategies, tools and skills to use when communicating with families. This learning occurs under the guidance of an experienced, cooperating teacher and an NWTC instructor. (Prerequisite: 10-307-122, Childhood-Early Practicum 2)

### **10-307-131 CHILDHOOD-EARLY SEMINAR 3**

...reinforces the learning and increased skill level the student teacher gains in the early childhood classroom; analyze family involvement with the early childhood program; communication tools. Discuss and problem solve with fellow classmates; analyze teaching/learning practices. (Corequisite: 10-307-130, Childhood-Early Practicum 3)

### **10-307-133 CHILDHOOD-ADMINISTERING**

**EARLY EDUCATION** ...early childhood education program development and management; financial plans, staff, program philosophy, developmentally appropriate programs, policies, records, and opportunities for family involvement. (Prerequisite: 10-307-130, Childhood-Early Practicum 3)

### **10-307-135 CHILDHOOD-EARLY PRACTICUM/**

**PROFESSIONALISM 4** ...serve as a classroom teacher in a childcare center or other Early Education Program. Higher-level skills for observing and recording children's behavior, integrate anti-bias strategies and develop learning plans to facilitate children's play by serving as a student teacher in an early childhood classroom. Professionalism in the early childhood education field; portfolio development. This learning occurs under the guidance of an experienced, cooperating teacher and an NWTC instructor. (Prerequisite: 10-307-130, Childhood-Early Practicum 3)

### **10-307-136 CHILDHOOD-EARLY SEMINAR 4**

...reinforces the learning and increased skill level the student teacher gains in the early childhood classroom; advocate for families; family communication tools; staff development strategies; discuss and problem solve with fellow classmates, analyze teaching/learning practices. (Corequisite: 10-307-135, Childhood-Early Prac/Prof 4)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Electrical Engineering Technology Program Code 106621

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Electronic Engineering Technology prepares students to test, maintain, and troubleshoot electrical and electronic devices as found in machinery, computers, and communications. The EET grad will be able to transfer to a four-year bachelor's degree program in Electrical Technology.

Graduates of the Electrical Engineering Technology Program will be able to:

- 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 boolean 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information. First semester DC and Intermediate Algebra have 804-130, Algebra/Trig, as a prerequisite.

### MATH LEVEL

To complete the program in a minimum of two years, students must have satisfied or completed Algebra/Trig 804-130 before entering first semester. 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 as an Electrical/Electronic Development Technician, Electrical/Electronic Maintenance Technician, Electrical Test Technician, Electrical/Electronics Technician, and Field Service Technician.

### 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 an 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.

**With the additional education this transfer program affords, 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

**EARNING POTENTIAL:** Graduates of the Electrical Engineering Technology Associate Degree program have the potential to earn over \$50,000 per year after five years of work experience. Graduates who transfer and complete the four-year Electrical Engineering Technology program can expect larger returns initially and larger lifetime earnings.

### CURRICULUM

The Electrical Engineering Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 70 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-620-140	Machine Wiring	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	Communication-Written	3
10-804-131	Math-Algebra/Inter	3
* 10-809-195	Economics	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

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	Reporting-Technical	3
10-804-132	Math-Geometry/Analytic	3
10-806-150	Physics 1-Technical	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### THIRD SEMESTER

10-605-160	Linear Electronics 1 BJT Amps	1
10-605-161	Linear Electronics 2 JFET Amps	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
* 10-809-196	Intro to Sociology	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-605-166	Micro 4: Advanced Interfacing	1
10-605-167	Micro 5: Intermediate	1
10-605-168	Micro 6: Advanced	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
10-620-159	Power Electronics 3: Drives	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
	OR	
* 10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

\* Taken in any order

This program is fully eligible for financial aid.

## 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)

### 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. (Corequisite: 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.

### 10-605-162 MICROPROCESSORS 2: TECHNIQUE

...complex addressing modes, fields in programming, pseudo-ops, programming technique, and continued use of simulation software. (Corequisite: 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. (Corequisite: 10-605-164, Micro 2: Technique)

### 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.

### 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. (Corequisite: 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. (Corequisite: 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.

### 10-605-181 ANALOG COMMUNICATIONS 2: AM/SSB

...characteristics of single sideband transmission and receiving systems. (Corequisite: 10-605-180, Analog Comm 1: Noise Effects)

### 10-605-182 ANALOG COMMUNICATIONS 3: FM

**SYSTEMS** ...characteristics of frequency modulation transmission and receiving systems. (Corequisite: 10-605-181, Analog Comm 2: AM/SSB)

### 10-620-159 POWER ELECTRONICS 3: DRIVES

...power circuitry of AC and DC drives and application of an industrial DC and AC drives to DC and AC motors. (Prerequisite: 10-660-112, Basic Electronics 3: Op-Amps; Corequisite: 10-620-161, Power Electricity 1: Motors)

### 10-620-161 POWER ELECTRICITY 1: MOTORS

...causes and results of magnetism and magnetic fields, laws of magnetic/electric interactions, DC machine and dynamo configuration, Shunt, S.E. Shunt, and PM DC machine 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. (Corequisite: 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. (Corequisite: 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. (Prerequisite: 10-804-130, Algebra/Trigonometry)

### 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. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry; Corequisite: 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. (Corequisite: 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. (Prerequisites: 10-660-105, DC 2-Circuits and 10-804-131, Algebra-Intermediate)

### 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. (Corequisite: 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: 10-660-106, DC 3: Circuit Theorems; 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. (Corequisite: 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. (Corequisite: 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. (Corequisite: 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. (Corequisite: 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: 10-605-136, Electronics-Linear)

# Electrical Power Distribution Program Code 314132

## TECHNICAL DIPLOMA - NINE MONTH (Begins in June)

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Electrical Power Distribution Program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- Be able to obtain a commercial driver's license
- Place satisfactorily in the NWTC mathematics examination

### MATH LEVEL

Students should have mastered basic math skills. For a description of Basic Math, see the Basic Education section of catalog.

### 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 32 credits.

#### FIRST SEMESTER (SUMMER)

Course No.	Description	Credits
31-413-330	Line Elec Field Trng 1	5
31-413-353	Electricity-Basic	1
31-413-362	Line Elec-Safety 1	1
31-804-310	Math-Algebra/Trades	2
<b>SEMESTER TOTAL</b>		<b>9</b>

#### SECOND SEMESTER

10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	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
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

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>7</b>

This program is fully eligible for financial aid.

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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.

### 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. (Prerequisite: 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)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Electricity

Program Code 314131

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC. Visit the Electricity Web Site at [www.nwtc.edu](http://www.nwtc.edu).

### PROGRAM DESCRIPTION

Electricity prepares students to install, maintain, and service basic electrical equipment used in residential, commercial, and industrial settings.

Graduates of the Electricity Program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- Place satisfactorily in the NWTC mathematics and algebra examinations

### MATH LEVEL

Students should have mastered high school algebra skills and have a desire to learn advanced algebra and trigonometry. 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 Construction Electrician or Industrial Maintenance Electrician.

**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

Please visit the Electricity Program Web site at [www.nwtc.edu](http://www.nwtc.edu)

### CURRICULUM

The Electricity Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 29 credits.

#### FIRST SEMESTER

Course 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
31-804-311	Algebra-Electricity	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>

This program is fully eligible for financial aid.

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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.

**31-413-314 DC CIRCUITS** ...electron theory, electromotive force sources, voltage, current, resistance, power, ohm's law, series-parallel circuits and test equipment. (Corequisite: 31-804-311, Algebra-Electricity)

**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. (Prerequisite: 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. (Prerequisites: 31-413-319, Residential Wiring 1; Corequisite: 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. (Corequisites: 31-413-314, DC circuits; 31-804-311, Algebra Electricity)

**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)

**31-413-346 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. (Prerequisite: 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Electro-Mechanical Technology Program Code 106201

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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, and programmable controllers found on industrial machinery.

Graduates of the Electro-Mechanical Technology Program will be able to:

- Understand and apply knowledge of electricity, electronics, hydraulics, and 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 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

### MATH LEVEL

Students should have mastered algebra skills before entering this program. First semester 804-131: Algebra-Intermediate has a prerequisite: 804-130: Algebra/Trigonometry.

### EMPLOYMENT POTENTIAL

A graduate of the program will have the potential for employment as an Automated Equipment Technician, Electro-Mechanical Technician, Electronics Technician, Field Service Technician, Fluid Power Technician, and Installation Technician.

#### AUTOMATED EQUIPMENT TECHNICIAN:

maintains and repairs electronically-controlled automatic production equipment including servohydraulics 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 engineer 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 67 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-620-110	Electromech Fundamentals 1	1
10-620-111	Electromech Fundamentals 2	1
10-620-121	Mechanics 1: Basic	1
10-660-101	Digital 1: Logic	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
10-804-131	Math-Algebra/Inter	3
10-809-199	Psychology-Human Rel	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>17</b>

#### SECOND SEMESTER

10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
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
10-664-102	Automation 3: PLC	1
10-664-103	Automation 4: PLC	1
10-664-104	Automation 5: PLC	1
10-664-105	Automation 6: PLC	1
10-801-195	Communication-Written	3
10-804-132	Math-Geometry/Analytic	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

#### THIRD SEMESTER

10-420-171	Machine Tool Processes 1	1
10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Circuits	1
10-620-159	Power Electronics 3: Drives	1
10-620-122	Mechanics 2: Intermediate	1
10-620-123	Mechanics 3: Systems	1
10-620-140	Machine Wiring	1
10-620-161	Power Electricity 1: Motors	1
10-620-162	Power Electricity 2: Motors	1
10-620-165	Fluids 3: Inter Hydraulics	1
10-620-166	Fluids 4: Advanced Hydraulics	1
10-809-195	Economics	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>17</b>

#### FOURTH SEMESTER

10-420-172	Machine Tool Processes 2	1
10-442-150	Machine Fabrication 1	1
10-442-151	Machine Fabrication 2	1
10-620-105	Rigging Systems 1	1
10-620-106	Rigging Systems 2	1
10-620-150	Industrial Enclosures	1
10-620-189	Machine Integrated Techniques	3
10-801-197	Reporting-Technical	3
10-801-198	Speech	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

This program is fully eligible for financial aid.

## COURSE DESCRIPTIONS

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

**10-442-150 MACHINE FABRICATION 1** ...a study of joining methods of fabrication.

**10-442-151 MACHINE FABRICATION 2** ...a study of fabrication processes. (Corequisite: 10-442-150, Machine Fabrication 1)

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics of JFETs, MOSFETs, SCRs, Shockley Diodes, Diacs, Triacs, GTOs, IGBTs, SBSs, UJT, and PUTs.

**10-605-158 POWER ELECTRONICS 2: CIRCUITS** ...application of FETs, MOSFETs, SCRs and Triacs to power circuits, triggering circuits for power control circuitry, power control and drive circuits. (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. (Prerequisite: 10-620-111, Electromechanical Fundamentals 2)

**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)

**10-620-110 ELECTROMECHANICAL FUNDAMENTALS 1** ...fundamentals of mechanics and mechanical systems including linear motion, linear forces, torque, and equilibrium leading to an understanding of work, energy, and power in mechanical systems. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry)

**10-620-111 ELECTROMECHANICAL FUNDAMENTALS 2** ...mechanics and mechanical systems by investigating momentum, rotational motion, work, energy, and power in mechanical systems culminating in an understanding of simple machines. (Corequisite: 10-620-110, Electromechanical Fundamentals 1)

**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. (Corequisite: 10-620-122, Mechanics 2: Intermediate)

**10-620-150 INDUSTRIAL ENCLOSURES** ...industrial enclosures, including basic documentation, sizing and device installation practices. (Prerequisite: 10-620-140, Machine Wiring 1; 10-664-101, Automation 2: Motor Control)

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC and DC drives and application of an industrial DC and AC drives to DC and AC motors. (Prerequisite: 10-660-112, Basic Electronics 3: Op-Amps; Corequisites: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ...causes and results of magnetism and magnetic fields, laws of magnetic/electric interactions, DC machine and dynamo configuration, Shunt, S.E. Shunt, and PM DC machine 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. (Corequisite: 10-620-165, Fluids 3: Intermediate Hydraulics)

**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 coursework; Corequisites: 10-442-151, Machine Fabrication 2; 10-620-150, Industrial Enclosures 1; 10-420-172, Machine Tool Processes 2)

**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.

**10-660-104 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. (Prerequisite: 10-804-130, Algebra/Trigonometry)

**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. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry; Corequisite: 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. (Prerequisites: 10-660-105, DC 2-Circuits and 10-804-131, Algebra-Intermediate)

**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. (Corequisite: 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: 10-660-106, DC 3: Circuit Theorems; 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. (Corequisite: 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. (Corequisite: 10-660-111, Electronics 2: Transistor-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. (Prerequisite: 10-664-101, Automation 2: Motor Control; 10-660-101, Digital 1: Logic)

**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** ...Analog/Digital Interfacing, Analog Input/Output Module Interfacing, Data Manipulation, Math and Sequencer/Shift Register Instructions, Analog Conversion/Scaling Programming, and Control Application Programming. (Corequisite: 10-664-103, Automation 4: PLC)

**10-664-105 AUTOMATION 6: PLC** ...Analog Controllogix Programming. (Corequisite: 10-664-104, Automation 5: PLC)

# Electronics

Program Code 106051

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Electronics prepares students to operate, test, maintain, and troubleshoot electronic equipment such as automatic control, computers, and communications equipment. It is also designed to prepare technicians to work with Electronic Research and Development engineers.

Graduates of the Electronics Program will be able to:

- 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

### MATH LEVEL

Students should have mastered algebra skills before entering this program. 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 as an Electronic Development Technician, Electronic Maintenance Technician, Electronic Test Technician, Electronics Technician, and Field Service Technician.

### ELECTRONIC DEVELOPMENT TECHNICIAN:

assists engineers in the design and development of experimental and prototype electronic equipment and products.

### 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.

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

- Computer Field Service Supervisor
- Electronics Production Superintendent
- Electronics Maintenance Supervisor

### EARNING POTENTIAL

Graduates of the Electronics program have the potential to earn over \$50,000 per year after five years of work experience.

### CURRICULUM

The Electronics Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 65 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-620-140	Machine Wiring	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	Communication-Written	3
10-804-131	Math-Algebra/Inter	3
10-809-195	Economics	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

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
10-664-100	Automation 1: Control Logic	1
10-801-197	Reporting-Technical	3
10-804-132	Math-Geometry/Analytic	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

10-605-160	Linear Electronics 1 BJT	1
10-605-161	Linear Electronics 2 JFET	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
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Circuits	1
10-605-159	Power Devices	1
10-605-166	Micro 4: Advanced Interfacing	1
10-605-167	Micro 5: Intermediate	1
10-605-168	Micro 6: Advanced	1
10-605-173	Datacomm 4: Digital Modulation	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
	Elective	3
<b>SEMESTER TOTAL</b>		<b>15</b>

**SUGGESTED ELECTIVES:** Internship (10-605-195), CAD-Electron Tech (10-606-101), Math 3-Tech Calc (10-804-170).

This program is fully eligible for financial aid.

## 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 of JFETs, MOSFETs, SCRs, Shockley Diodes, Diacs, Triacs, GTOs, IGBTs, SBSs, UJT, and PUTs.

**10-605-158 POWER ELECTRONICS 2: CIRCUITS** ...application of FETs, MOSFETs, SCRs and Triacs to power circuits, triggering circuits for power control circuitry, power control and drive circuits. (Corequisite: 10-605-157, Power Electronics 1: Devices)

**10-605-159 POWER DEVICES: SWITCHING POWER SUPPLIES** ...characteristics of switching power supply systems. (Corequisite: 10-605-158, Power Electronics 2: Circuits)

**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)

**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. (Corequisite: 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.

**10-605-162 MICROPROCESSORS 2: TECHNIQUE** ...complex addressing modes, fields in programming, pseudo-ops, programming technique, and continued use of simulation software. (Corequisite: 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. (Corequisite: 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. (Corequisite: 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. (Corequisite: 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.

**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. (Corequisite: 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. (Corequisite: 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: 10-605-173, Data Comm 4: Digital 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.

**10-605-181 ANALOG COMMUNICATIONS 2: AM/SSB** ...characteristics of single sideband transmission and receiving systems. (Corequisite: 10-605-180, Analog Comm 1: Noise Effects)

**10-605-182 ANALOG COMMUNICATIONS 3: FM SYSTEMS** ...characteristics of frequency modulation transmission and receiving systems. (Corequisite: 10-605-181, Analog Comm 2: AM/SSB)

**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. (Corequisite: 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. (Corequisite: 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. (Prerequisite: 10-804-130, Algebra/Trigonometry)

**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. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry; Corequisite: 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. (Corequisite: 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. (Prerequisites: 10-660-105, DC 2- Circuits and 10-804-131, Algebra-Intermediate)

**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. (Corequisite: 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: 10-660-106, DC 3: Circuit Theorems; 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. (Corequisite: 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. (Corequisite: 10-660-111, Electronics 2: Transistor-Basic)

# Emergency Medical Technician-Basic Program Code 305313

## TECHNICAL DIPLOMA - ONE SEMESTER

Offered throughout the District. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5485. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Emergency Medical Technician-Basic students perform emergency patient care and basic life support in the field, transporting injured and ill patients to hospital emergency departments. They also perform care in hospital emergency departments.

Graduates of the Emergency Medical Technician-Basic Program will be able to:

- 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.

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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Must be 18 years or older to enter training
- Satisfactory placement in the NWTC reading evaluation
- First priority for admission is given to applicants sponsored by a Wisconsin licensed ambulance service. Unsponsored applicants are admitted only after the program is filled with sponsored students
- Proof of current health status and immunizations
- Background information disclosure form completion (or verification by ambulance service); {Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us)}Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

A graduate with an EMT-Basic Technical Diploma will have the potential for employment as an Emergency Medical Technician. Most ambulance services in Wisconsin are volunteer, but private ambulance services, fire departments, and hospital-based ambulance services employ EMTs in full-time paid positions. Some hospital emergency departments also employ EMTs.

### EMERGENCY MEDICAL TECHNICIAN:

Performs emergency patient care and basic life support in the field, transporting sick and injured patients to hospital emergency departments. Also performs care in hospital emergency departments.

### CURRICULUM

The EMT-Basic Technical Diploma is a one-semester program. Upon graduation, a student will have completed 4 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
30-531-310	EMT-Basic	4
<b>SEMESTER TOTAL</b>		<b>4</b>

This program is not eligible for financial aid.

### COURSE DESCRIPTIONS

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

**30-531-310 EMT-BASIC** ...preparatory aspects, airway management, patient assessment, medical/behavioral cases, trauma care, pediatric cases, and field operations in basic life-support emergency medical care.

# Emergency Medical Technician-I. V. Program Code 305316

## TECHNICAL DIPLOMA - ONE SEMESTER

Offered throughout the District. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5485. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

EMT - I.V. Technician students are Wisconsin licensed EMT - Basics seeking to upgrade their skills to the I.V. Technician level. EMT - I.V. Technician students perform emergency patient care, basic life support, and limited advanced life support in the field, transporting injured and ill patients to hospital emergency departments. They also perform care in hospital emergency departments.

Graduates of the EMT - I.V. Technician Program will be able to:

1. Apply the preparatory aspects of EMT I.V. technician care.
2. Demonstrate usage of basic pharmacological principles.
3. Perform intravenous therapy.
4. Manager cardiac, diabetic and narcotic overdose cases using medications.
5. Perform clinical skill competencies.

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.

### MATH LEVEL

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 - I.V. Technician Diploma will have the potential for employment as an EMT - I.V. Technician with a Wisconsin ambulance service licensed to provide EMT - I.V. Technician level care. Most ambulance services in Wisconsin are volunteer, but private ambulance services, fire departments, and hospital - based ambulance services may employ EMT - I.V. Technicians in full-time paid positions. Some hospital emergency departments may also employ EMT - I.V. Technicians.

**EMT - I.V. TECHNICIAN:** performs emergency patient care, basic life support, and limited advanced life support in the field, transporting sick and injured patients to hospital emergency departments. Also performs care in hospital emergency departments.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Must be 18 years or older to enter training
- Satisfactory placement in the NWTC reading evaluation
- **Affiliation with a Wisconsin licensed ambulance service approved at the I.V. Technician level**
- Current Wisconsin EMT-Basic license
- Current CPR recognition card
- Physician medical director endorsement of EMT skill competency
- Proof of current health status and immunizations
- Background information disclosure form completion (or verification by ambulance service); {Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).}

### CURRICULUM

The EMT-I.V. Technical Diploma is a one-semester program. Upon graduation, a student will have completed 2 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
30-531-340	EMT - I.V. Technician	2
SEMESTER TOTAL		2

This program is not eligible for financial aid.

### COURSE DESCRIPTIONS

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

**30-531-340 EMT I.V. TECHNICIAN** ...preparatory aspects, clinical decision-making, basic pharmacology, intravenous therapy, cardiovascular cases, diabetic cases, narcotic overdose cases, and clinical skill competencies in EMT I.V. Technician level emergency medical care.

# Farm Business and Production Management

## TECHNICAL DIPLOMA - SIX-YEAR, PART-TIME

Program Code 300901

Offered District-wide. Information in Green Bay: (920) 498-5457. Information in Marinette: (715) 732-3875. Information in Sturgeon Bay: (920) 746-4900. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Farm Business and Production Management Program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- 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

### MATH LEVEL

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 Herdperson
- General Farm Manager
- Farm Records Manager
- Crop Supervisor
- Livestock Feeding Specialist
- Farm Equipment and Facilities Maintenance Manager
- Farm Service Employee
- Field Equipment Operator

### CURRICULUM

The Farm Business and Production Management Technical Diploma is a six-year, part-time program. Upon graduation, a student will have completed 18 credits.

Course No.	Description	Credits
30-090-381	Farm Business Operation	3
30-090-382	Soils Management	3
30-090-383	Crop Mgmt	3
30-090-384	Livestock Nutrition	3
30-090-385	Livestock Mgmt	3
30-090-386	Farm Record/Busi Analy	3
<b>SEMESTER TOTAL</b>		<b>18</b>

This program is not eligible for financial aid.

Tuition assistance is available through the Wisconsin Dept. of Agriculture and the Wisconsin Technical College Categorical Funding Tuition Assistance Grant.

## COURSE DESCRIPTIONS

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

**30-090-381 FARM BUSINESS OPERATION** ...farm organization; cash flow; financial statements and budgeting; credit needs; record keeping systems; business structure for farm operation; tax issues; farm business analysis; and decision making.

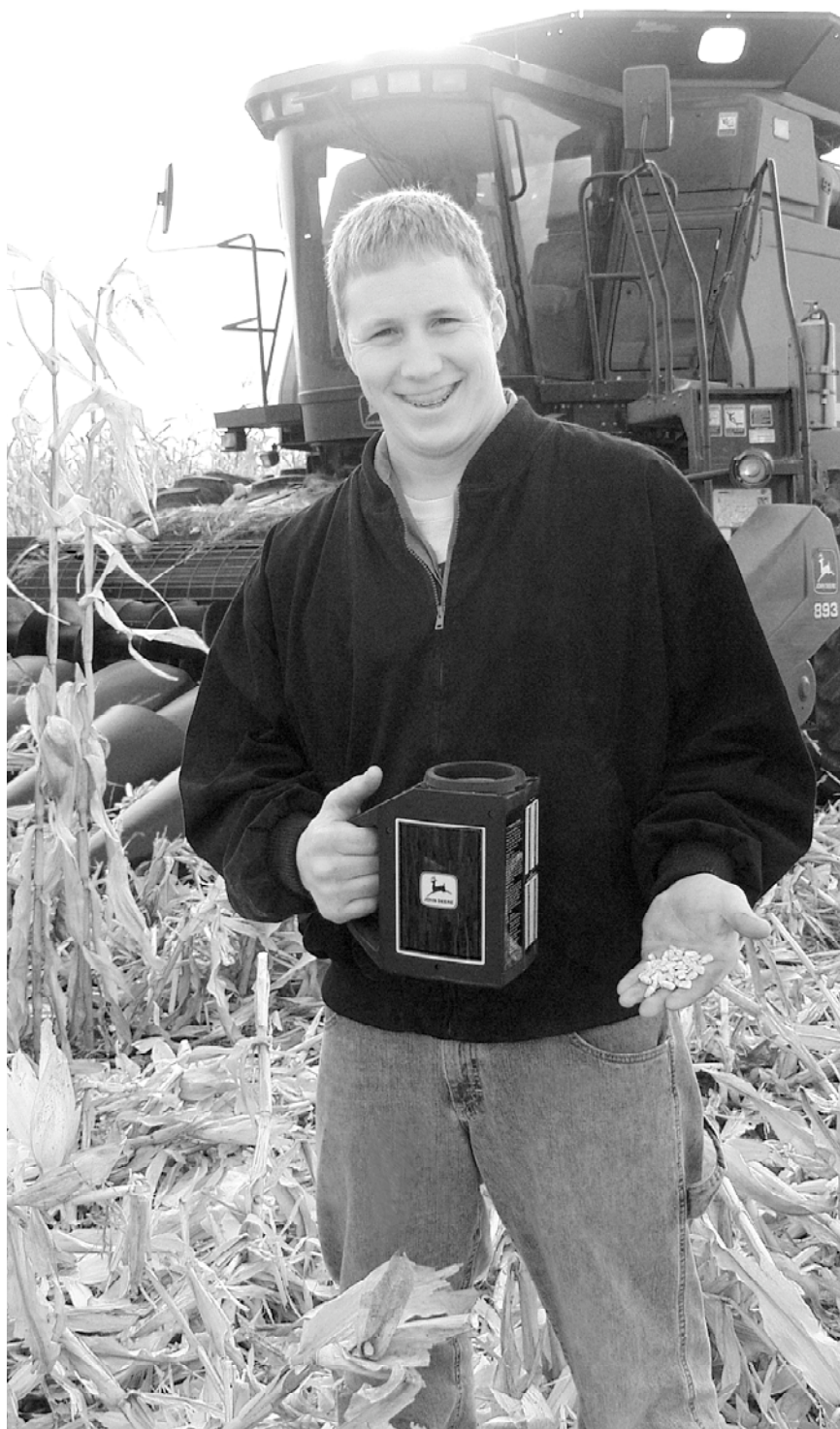
**30-090-382 SOILS MANAGEMENT** ...preparing and implementing a land use plan, soil testing procedures and reports, corrective fertilizers, soil conservation, safe use of farm machinery and equipment, and farm business analysis.

**30-090-383 CROP MANAGEMENT** ...economics, alternative crop strategies, production management, variety selection, maintenance fertilization, pest controls and chemicals, harvesting, storage, marketing, and farm business analysis.

**30-090-384 LIVESTOCK NUTRITION** ...sound feeding management; economics of feeds; nutritional terminology and requirements; feed consumption; feed tag labels for protein, energy, minerals, and vitamins; evaluate feeding programs; and metabolic diseases.

**30-090-385 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.

**30-090-386 FARM RECORD/BUSINESS ANALYSIS** ...farm business goals, use of farm credit, farm business arrangements, orderly farm transfer, farm estate planning, farm income taxes, computer records, and farm business analysis.



Descriptions of courses not found on this page can be found in the back of the catalog.

# Financial Institutions Management Program Code 101028

## ASSOCIATE DEGREE - FIVE YEARS, PART-TIME, WITH SHORTER OPTIONS AVAILABLE

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444.

Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Financial Institutions Management is designed for current or prospective employees of financial institutions seeking specialized training.

Graduates of this program will be able to:

- Analyze business and consumer financial documents.
- Ensure compliance with state and federal laws.
- Recommend appropriate financial products to customers.
- Use marketing tools and techniques.
- Assess how economic policies and changes in the level of business activity affect the financial industry.
- Make loan decisions.
- Contact customers regarding outstanding balances.
- Negotiate payment proposals with customers.
- Manage the work of other people in a team environment.
- Deliver effective customer service.
- Use an electronic word processing computer program.
- Use an electronic spreadsheet computer program.
- Perform basic business math calculations.
- Use a financial calculator.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard

### MATH LEVEL

Students should have mastered basic math skills before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### 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 as a Customer Service Representative (CSR), Personal Banker, and Loan Officer.

### 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

### CURRICULUM

The Financial Institutions Management Associate Degree is a five-year, ten-semester program. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-102-151	Banking Principles	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-132	Micro: Excel-Part 2	1
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>9</b>

#### SECOND SEMESTER

10-101-110	Accounting 1	4
10-102-122	Financial Inst-Mktg	3
<b>SEMESTER TOTAL</b>		<b>7</b>

#### THIRD SEMESTER

* 10-102-101	Financial Applications	3
10-104-111	Credit-Consumer	4
<b>SEMESTER TOTAL</b>		<b>7</b>

#### FOURTH SEMESTER

10-102-166	Collection Methods	3
10-801-195	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### FIFTH SEMESTER

10-102-150	Law-Business	3
10-801-196	Oral/Interpersonal Comm	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### SIXTH SEMESTER

10-102-161	Law-Credit	4
10-809-195	Economics	3
Elective		3
<b>SEMESTER TOTAL</b>		<b>10</b>

#### SEVENTH SEMESTER

10-102-180	Money/Banking	3
10-104-121	Credit Management Practices	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### EIGHTH SEMESTER

10-102-125	Mortgage Lend/Serv	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### NINTH SEMESTER

10-102-155	Trust Functions/Service	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### TENTH SEMESTER

10-102-167	Commercial Lending	3
Elective		3
<b>SEMESTER TOTAL</b>		<b>6</b>

**SUGGESTED ELECTIVES:** Any course in the Business Administration Credit or Accounting program.

\* Note: Strongly recommend students take Accounting 1 prior to enrolling in Financial Applications.

This program is fully eligible for financial aid.

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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.

**10-102-101 FINANCIAL APPLICATIONS** ...use of financial calculators, checkbook records, purchasing systems, shipping/receiving systems, A/R systems, A/P systems, business loans, breakeven analysis, sales gain/loss, depreciation methods, inventory methods, and financial statement analysis.

**10-102-122 FINANCIAL INSTITUTIONS-MARKETING** ...fundamental concepts of marketing and the application of these concepts; as financial institutions enter the electronic era, effective marketing will be critical in determining the course of the industry.

**10-102-125 MORTGAGE LENDING/SERVICING** ...principles and practices involved in making and closing mortgage loans and servicing a sound mortgage portfolio, including the secondary mortgage market.

**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.

**10-102-151 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.

**10-102-155 TRUST FUNCTIONS/SERVICE** ...trust functions; estate settlement; guardianships; trust services; performance of agencies, individuals, business organizations, charitable institutions; and trust administration.

**10-102-161 LAW-CREDIT** ...Uniform Commercial Code, credit regulations, Wisconsin Consumer Protection Law, collection law, and bankruptcy. (Prerequisite: 10-104-111, Credit-Consumer)

**10-102-166 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: 10-104-111, Credit-Consumer)

**10-102-167 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.

**10-102-180 MONEY/BANKING** ...economics and banking, commercial banking system, money supply, investments and loans, Federal Reserve System, and international monetary system.

**10-104-111 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.

**10-104-121 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Fire Protection Engineering Technology Program Code 105033

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Marinette campus. Admissions, registration, or counselor and course information: (715) 735-9361 or (920) 498-5444. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Fire Protection Engineering Technology teaches students to design, install, and service automatic sprinkler, fire alarm, and special hazard fire suppression systems.

Graduates of the Fire Protection Engineering Technology Program will be able to:

- 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 protection systems.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

### MATH LEVEL

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 Fire Protection Systems Designer, Fire Protection Equipment Sales Representative, Fire Protection Systems Installer, and Industrial Safety Technician in the areas of automatic fire sprinklers, special hazards, and fire alarm systems.

#### **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 insures 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

### 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

Course No.	Description	Credits
10-503-113	Fire Extinguisher-Portable	2
10-503-114	Fire Protection Fundamentals	3
10-503-115	Fire Tech Prt Rdg/Sketching	3
10-606-115	CAD	3
10-801-196	Oral/Interpersonal Comm	3
10-804-120	Math-Tech Algebra	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
10-503-136	Sprinkler Systems 1	2
10-503-180	Nicet-Basic	2
10-606-128	CAD-Fire Tech Advanced	1
10-801-195	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>17</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
10-503-137	Sprinkler Systems 2	4
10-503-138	Hazard Analysis	3
10-809-199	Psychology-Human Rel Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-503-140	Special Hazards Systems 2	3
10-503-148	Technical Project	3
10-801-197	Reporting-Technical	3
10-809-197	Society-Amer Contemp Elective	3
		2
		2
<b>SEMESTER TOTAL</b>		<b>16</b>

**SUGGESTED ELECTIVES:** NICET Advanced-Automatic Sprinklers (10-503-181), NICET Advanced-Special Hazards (10-503-182), and NICET Advanced-Alarms (10-503-183).

This program is fully eligible for financial aid.

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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.

### **10-503-113 FIRE EXTINGUISHER-PORTABLE**

...water extinguishers, CO2 extinguishers, dry chemical extinguishers, halogenated extinguishers, use of fire extinguishers, national fire codes and test standards, and hydrotesting procedures.

### **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.

### **10-503-120 SPECIAL HAZARDS SYSTEMS 1**

...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 fire pump selection.

**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. (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 System 1; 10-503-128, Fire Alarm System Design)

**10-503-148 TECHNICAL PROJECT** ...independent research report or project utilizing technical and communication skills from Fire Protection Engineering Technician program.

**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."

Descriptions of courses not found on this page can be found in the back of the catalog.

# Gas Utility Construction and Service

Program Code 314692

## TECHNICAL DIPLOMA - NINE MONTH (JUNE START DATE)

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Gas Utility Construction and Service Program will be able to:

- 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 drivers license (CDL).

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- Be able to obtain a commercial driver's license
- Place satisfactorily in the NWTC mathematics examination

### MATH LEVEL

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 Propane Gas Delivery Person, New Customer Tank and Cylinder Installer, Bulk Plant Operator, Gas Construction Mechanic, Gas Meter Mechanic, Gas Service Mechanic, Gas Clerk-Estimator, Gas Regulator Maintenance Mechanic, Gas Appliance Repair Mechanic, and Underground Facilities Locator.

**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, 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 over-pressure 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 is 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 32 credits.

#### FIRST SEMESTER (SUMMER)

Course No.	Description	Credits
31-442-315	Welding-Gas Service 1	2
31-469-310	Gas Utility Field Trng 1	4
31-804-310	Math-Algebra/Trades	2
<b>SEMESTER TOTAL</b>		<b>8</b>

#### SECOND SEMESTER

31-413-348	Electricity-Basic	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
31-801-386	Communicating Effectively	1
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

31-413-358	Electricity-Gas Applianc	2
31-422-310	Metallurgy	2
31-469-340	Gas Utility Field Trng 4	4
<b>SEMESTER TOTAL</b>		<b>8</b>

This program is fully eligible for financial aid.

**NOTE:** Students also receive certification on Midwest Energy Pipeline Operator Qualification. This certificate is recognized throughout the United States. Northeast Wisconsin Technical College is recognized as a Midwest Energy Association Regional Evaluation Center for testing and training entry and incumbent workers.

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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.

**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)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Health Care Business Services Program Code 101601

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Health Care Business Services prepares a student to work in the business office of medical and dental clinics, hospitals, nursing homes, related health care facilities, health insurance settings in administrative, financial, and customer service roles.

Students begin their programs with the SAME course selection that is required for students in Health Information Technology. The first two semesters for Health Information Technology and Health Care Business Services are identical and offer students opportunities to learn about and observe work in both areas through field study experiences. This is a unique opportunity within the College.

A graduate of this program will be able to:

- 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 a financial calculator.
- 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. Health Care Delivery System.
- Balance a checkbook to a bank statement.
- Apply computer skills specific to health care and health insurance.
- Process supply inventory.
- Record accounting and financial transactions in a medical setting.
- Use a computer keyboard.
- Use effective telephone techniques.
- Use stress management techniques.
- Participate in an employment interview.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard
- Ability to work with co-workers, patients, and health care providers

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Health Care Business Services students must fulfill this requirement if they choose to take General Anatomy & Physiology.

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Medical Accountant/Bookkeeper, Admitting Representative, Appointment Secretary, Claims Analyst, Insurance Billing Specialist, Medical Records Associate, Patient Services Representative, Patient Accounts Associate, Provider Relations Associate, Financial Services Representative, Medical and Insurance Customer Service Representative.

**MEDICAL ACCOUNTANT/BOOKKEEPER:** keeps financial records; prepares financial statements, balance sheet, and summary reports; analyzes accounts; handles the bookkeeping system of accounts payable and receivable; processes collections; handles end-of period reports related to a medical facility.

**ADMITTING REPRESENTATIVE:** accomplishes patient admitting procedures by interviewing the patient and entering information on a computer terminal or admitting form system.

**APPOINTMENT SECRETARY:** makes appointments for a doctor and contacts patients related to appointment changes, in a clinic or hospital outpatient setting.

**CLAIMS ANALYST:** processes insurance claims on a computer terminal, performs claims investigations, provides customer service to insureds and insurance purchasers.

**INSURANCE BILLING SPECIALIST:** makes sure that patient accounts are billed to the proper insurance carrier and all needed patient information is collected.

**MEDICAL RECORDS ASSOCIATE:** handles all patient medical records in areas such as progress notes, pulls records of patients on a daily basis.

**PATIENT SERVICES REPRESENTATIVE:** greets, schedules, assists patients in a clinic setting.

**PATIENT ACCOUNTS ASSOCIATE:** records money, makes bank deposits, provides for collection preparation.

**PROVIDER RELATIONS ASSOCIATE:** works with contracted medical providers to implement contract terms and provider staff training.

**FINANCIAL SERVICES REPRESENTATIVE:** meets with patients to analyze and explain health benefits and negotiates a payment agreement with the patient.

**MEDICAL AND INSURANCE CUSTOMER SERVICE REPRESENTATIVE:** responds to patient and insured questions, explains health benefits, identifies options, and solves problems.

**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

### CURRICULUM

The Health Care Business Services Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-111	Micro: Windows-Introduction	1
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-160-111	Health Care Overview	2
10-501-101	Medical Terminology	3
10-530-110	Medical Info Processing	3
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology-Human Rel OR	3
10-809-198	Intro to Psychology	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-103-141	Micro: Access-Intro	1
10-160-121	Medical Business/Law	1
10-160-131	Health Care Mgmt Process	2
10-160-161	Insurance Health Principles	3
10-530-120	Medical Transcription	1
10-530-135	Health Info-Legal	1
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
10-806-181	Anatomy/Struct-Funct	2
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

10-101-110	Accounting 1	4
10-104-191	Customer Service Mgmt	3
10-160-143	Medical Practice Proc	3
10-530-124	Diagnostic/Proc-Code 1	3
10-809-197	Society-Amer Contemp OR	3
10-809-196	Intro to Sociology Elective	3
<b>SEMESTER TOTAL</b>		<b>19</b>

#### FOURTH SEMESTER

10-101-145	Financial Mgmt-Medical	3
10-160-140	Health Care Internship OR	3
10-160-141	Health Care Field Study	3
10-160-142	Medical Credit/Collect	2
10-160-151	Health Care Relations	2
10-809-195	Economics Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

**SUGGESTED ELECTIVES:** Micro: Powerpoint-Introduction (10-103-151), Health Care Business Trends (10-160-144), Problem Solving Team Building (10-196-189), Health Care-Quality (10-530-131), Health Statistics (10-530-132).

Students may substitute General Anatomy & Physiology (10-806-193) for Anatomy/Structure-Function (10-806-181) to also complete the Medical Coding certificate.

This program is fully eligible for financial aid.

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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.

### **10-101-145 FINANCIAL MANAGEMENT-**

**MEDICAL** ...budgeting, operations, cash flow, capital; rate setting process; working capital management; health care credit; cash and short-term investments; inventory management; long-term financing; leasing; purchasing capital equipment; and reporting operating results.

### **10-160-111 HEALTH CARE OVERVIEW** ...U.S.

health care system beliefs and evolution, professionals and technologies, financing, outpatient and inpatient facilities, managed care, marketing, integrated delivery, U.S. system compared to others, future of health systems, field study.

**10-160-121 MEDICAL BUSINESS/LAW** ...code of ethics, ethical questions in the medical setting, patient's rights, law introduction, lawyers and clients, judges, courts, juries, civil action, appeal, out-of-court settlements, contract laws, wills, trusts.

### **10-160-131 HEALTH CARE MANAGEMENT**

**PROCESSES** ...management and supervision in health care institutions: planning, organizing, staffing, directing and controlling, and labor relations.

### **10-160-140 HEALTH CARE BUSINESS SERVICES**

**INTERNSHIP** ...career planning, resumes, interviews, search strategy, actual health care work experience, applied workplace improvements and ethical model.

### **10-160-141 HEALTH CARE FIELD STUDY** ...career

planning, resumes, interviews, work flow and services quality analysis in health care settings, recommended improvements, health care issue analysis, applied ethical model.

### **10-160-142 MEDICAL CREDIT/COLLECTIONS**

...credit in a medical facility; history, definition, and department organization; granting credit in a medical facility; controlling credit: collecting the account, measuring the effort, and auditing the function.

### **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.

### **10-160-151 HEALTH CARE RELATIONSHIPS**

...the financing of health care, managed care participants and products, integrated systems, organization structure, provide networks, purchase cost containment, quality of care, regulation, and accountability.

### **10-160-161 INSURANCE HEALTH PRINCIPLES**

...risk; health and dental insurance; worker's compensation; malpractice; government plans: Medicare, Medicaid, CHAMPUS; TriCare, BadgerCare, Managed Care; Benefit Plan Design; and Provider Contracts.

**10-501-101 MEDICAL TERMINOLOGY** ...spelling, pronunciation, definition, and abbreviation application; word roots, prefixes and suffixes, and anatomical structure.

### **10-530-110 MEDICAL INFORMATION PROCESSING**

...medical record contents/registration, procedures, quantitative analysis, numbering, filing, record control, retention, abstracting, and indexing; computerization of medical records and processing activities.

### **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: 10-510-165, Medical Terminology; 10-103-121, Micro:Word Introduction)

### **10-530-124 DIAGNOSTIC/PROCEDURAL-CODING 1**

...the International Classification of Diseases (ICD-9-CM) and Current Procedural Terminology (CPT) with emphasis on basic coding skills, use of this classification system in acute and other health care settings, its application for statistical and reimbursement purposes. (Prerequisite: 10-806-181, Anatomy/Structure Function)

### **10-530-135 HEALTH INFORMATION-LEGAL** ...the

American legal system; evaluate privacy, confidentiality, privileged communication rights and responsibilities and consent; evaluate health care legislation.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Health Information Technology

Program Code 105301

## ASSOCIATE DEGREE - TWO YEARS, PLUS ONE SUMMER

Offered at the Green Bay campus. Admissions, registration, counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Health Information Technology program teaches students to work with medical records and statistics, code medical data, maintain health record systems, transcribe medical information, and control the usage and release of health information.

Students who have an interest in the business and information aspects of health care, but are unsure of their options and preferences in this growing field, have a special opportunity. Students begin their programs with the SAME course selection that is required for students in Health Care Business Services. The first two semesters for Health Information Technology and Health Care Business Services are identical and offer students opportunities to learn about and observe work in both areas through field study experiences. This is a unique opportunity within the College.

Graduates of the Health Information Technology program will be able to:

- Be successfully employed in the field.
- Define health care data elements.
- Evaluate documentation.
- Collect, store, and retrieve patient and departmental data.
- Assign diagnostic/procedure codes.
- Monitor data accuracy.
- Analyze, interpret, and present healthcare data/statistics.
- Understand information technology/systems.
- Manage/supervise resources, training, projects, and processes in the Health Information Department.
- Act to improve performance and strategic thinking in the Health Information Department and institution.
- Monitor changes in and compliance with the legal and regulatory environment related to health information.
- Release health information/patient records.
- Apply principles of organization, financing, and delivery of health care services.
- Apply principles of biomedical sciences.
- Use basic microcomputer applications.

Students will be required to provide their own transportation to clinical facilities, pay for liability insurance for each affiliation, and cover any other expenses related to their fieldwork experience.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- A high school diploma or equivalent
- High school biology or the equivalent
- A medical examination satisfactorily completed within three months before entering the program
- Attendance at program orientation
- Keyboard self-assessment

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Coder/Abstractor, Release of Information Specialist, Health Record Analyst, Discharge Analyst, Cancer Registrar, Medical Transcriptionist, Quality Analyst/Case Manager, or Supervisor in a Health Information/Medical Record Department. Career opportunities are available in the following facility areas: hospitals, clinics, nursing homes, mental health facilities, and home health agencies; state and federal health agencies; and private industry (insurance, microfilm, record storage and retrieval, computer vendors, and copy service companies).

**CODER/ABSTRACTOR:** assigns diagnosis and procedure codes according to recognized classification systems, retrieves and enters patient health information into a computerized system.

**RELEASE OF INFORMATION SPECIALIST:** responsible for the usage and proper release of health information.

**HEALTH RECORD ANALYST:** retrieves and displays health data for administrative and health statistics using the medical record or a variety of computerized health record indexes.

**DISCHARGE ANALYST:** organizes, analyzes, and technically evaluates medical records according to established standards.

**CANCER REGISTRAR:** retrieves and displays data on a facility's treatment and staging of cancer cases and is an integral part of a cancer program and its accreditation by the American College of Surgeons.

**MEDICAL TRANSCRIPTIONIST:** uses transcription and word processing equipment to transcribe dictation from physicians and allied health professionals. The Registered Health Information Technician [RHT] (formerly Accredited Record Technician [ART]) generally would become a supervisor of this function.

**QUALITY ANALYST/CASE MANAGER:** retrieves and displays health data using predetermined criteria to assist organizations in their quality improvement/case management process.

**SUPERVISOR IN A HEALTH INFORMATION/MEDICAL RECORD DEPARTMENT:** may be responsible for all or part of the functions listed above in addition to assisting with the maintenance of optimum information storage and retrieval systems.

**NOTE:** Students who do not meet the requirements for program entry should consult an NWTC counselor about ways to make up any deficiencies through testing or course work.

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### CURRICULUM

The Health Information Technology Associate Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 67 or 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-111	Micro: Windows-Introduction	1
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
* 10-160-111	Health Care Overview	2
10-501-101	Medical Terminology	3
* 10-530-110	Medical Info Processing	3
10-801-195	Communication-Written	3
10-801-196	Oral/Interpersonal Comm	3
	<b>SEMESTER TOTAL</b>	<b>17</b>

#### SECOND SEMESTER

10-103-141	Micro: Access-Intro	1
* 10-160-131	Health Care Mgmt Process	2
* 10-160-161	Insurance Health Principles	3
* 10-530-120	Medical Transcription	1
* 10-530-135	Health Info-Legal	1
* 10-530-138	Health Info-Release of Info	1
10-806-177	Gen Anatomy & Physiology OR	4
10-806-181	Anatomy/Struc-Funct	2
10-809-198	Intro to Psychology OR	3
10-809-199	Psychology-Human Rel	3
	<b>SEMESTER TOTAL</b>	<b>16</b>

#### THIRD SEMESTER

10-809-195	Economics	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>6</b>

#### FOURTH SEMESTER

* 10-530-124	Diagnostic/Proc-Code 1	3
* 10-530-132	Health Statistics	2
* 10-530-133	Health Info Affiliation 1	1
* 10-530-182	Human Disease for Hlth Prof	3
10-809-196	Intro to Sociology OR	3
10-809-197	Society-Amer Contemp	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

#### FIFTH SEMESTER

* 10-530-131	Health Care-Quality	2
* 10-530-137	Diagnostic/Proc-Code 2	5
* 10-530-142	Health Info Tech Update	2
* 10-530-143	Health Info Affiliation 2A	3
* 10-530-144	Health Info Affiliation 2B	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

**SUGGESTED ELECTIVES:** Medical Practice Procedures (10-160-143), Health Care Business Trends (10-160-144), Micro: Powerpoint Intro (10-103-151), Customer Service Management (10-104-191).

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). Anatomy/Struc-Funct (10-806-181) is also accepted, but may not transfer to a bachelor's program.

**NOTES:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. Permission of Program Director is required if a student is not enrolled in this program.

**ACCREDITATION:** 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). The Health Information Technology program is accredited by the Commission on the Accreditation of Allied Health Education Programs (CAAHEP) in cooperation with the Council on Accreditation of the American Health Information Management Association, 919 N. Michigan Avenue, Suite 1400, Chicago, IL, 60611-1683. Phone: (312) 787-2672

This program is fully eligible for financial aid.

## COURSE DESCRIPTIONS

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

**10-160-111 HEALTH CARE OVERVIEW** ...U.S. health care system beliefs and evolution, professionals and technologies, financing, outpatient and inpatient facilities, managed care, marketing, integrated delivery, U.S. system compared to others, future of health systems, field study.

**10-160-131 HEALTH CARE MANAGEMENT PROCESSES** ...management and supervision in health care institutions: planning, organizing, staffing, directing and controlling, and labor relations.

**10-160-161 INSURANCE HEALTH PRINCIPLES** ...risk; health and dental insurance; worker's compensation; malpractice; government plans: Medicare, Medicaid, CHAMPUS; TriCare, BadgerCare, Managed Care; Benefit Plan Design; and Provider Contracts.

**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. **3 cr.**

**10-530-110 MEDICAL INFORMATION PROCESSING** ...medical record content, registration, procedures, quantitative analysis, numbering, filing, record control, retention, abstracting, and indexing; computerization of medical records and processing activities.

**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: 10-510-165, Medical Terminology; 10-103-121, Micro:Word Introduction)

**10-530-124 DIAGNOSTIC/PROCEDURAL-CODING 1** ...the International Classification of Diseases (ICD-9-CM) and Current Procedural Terminology (CPT) with emphasis on basic coding skills, use of this classification system in acute and other health care settings, its application for statistical and reimbursement purposes. (Prerequisites: 10-806-177, General Anatomy & Physiology or 10-806-181, Anatomy/Structure Function and 10-501-101, Medical Terminology)

**10-530-131 HEALTH CARE-QUALITY** ...quality management concepts; quality improvement processes; programs and procedures as they relate to medical records; utilization review, risk management, and other healthcare evaluation activities and requirements. (Prerequisite: 10-530-110, Medical Information Processing)

**10-530-132 HEALTH STATISTICS** ...medical statistical data collection and display including definitions and procedures for computing inpatient census, percentage of occupancy, mortality, autopsies, length of stay, and other rates; data presentation.

**10-530-133 HEALTH INFORMATION TECHNOLOGY-AFFILIATION 1** ...clinical facility assignments designed to allow students to observe, assist, and acquire skills in application of basic health information functions. (Prerequisites: 10-530-110, Medical Information Processing; 10-530-135, Health Information-Legal; 10-530-138, Health Info Release of Information; 10-530-120, Medical Transcription)

**10-530-135 HEALTH INFORMATION-LEGAL** ...the American legal system; evaluate privacy, confidentiality, privileged communication rights and responsibilities and consent; evaluate health care legislation.

**10-530-137 DIAGNOSTIC/PROCEDURAL-CODING 2** ...advanced ICD-9-CM coding skills; their application to the statistical and reimbursement mechanisms used in acute and other health care settings; structure and use of the CPT/HCPCS coding scheme. (Prerequisites: 10-530-124, Diagnostic/Proc Code 1; 10-806-198, Pathophysiology)

**10-530-138 HEALTH INFORMATION-RELEASE OF INFORMATION** ...legal consents, mechanism for releasing information, medical records as legal documents, and legal procedures in court disclosure of medical record information (Prerequisite: Satisfactory completion of semester 1).

**10-530-142 HEALTH INFORMATION TECHNOLOGY UPDATE** ...clinical situations including a review seminar in preparation for accreditation examination, and pre-accreditation/pre-graduation activities. (Prerequisite: satisfactory completion of prior coursework; Corequisites: 10-530-143, Health Info Affiliation 2A and 10-530-144, Health Info Affiliation 2B)

**10-530-143 HEALTH INFORMATION AFFILIATION 2A** ...application of previously acquired knowledge and skills in clinical experiences with the technical procedures of health record systems in various health care settings. (Prerequisite: Satisfactory completion of prior coursework; Corequisites: 10-530-144, Health Info Affiliation 2B; 10-530-142, Health Info Tech Update)

**10-530-144 HEALTH INFORMATION AFFILIATION 2B** ...application of previously acquired knowledge and skills in clinical experiences with the technical procedures of health record systems in various health care settings. (Prerequisite: Satisfactory completion of prior coursework; Corequisites: 10-530-143, Health Info Affiliation 2A; 10-530-142, Health Info Tech Update)

**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. (Corequisites: 10-501-101, Medical Terminology; and 10-806-177, General Anatomy & Physiology or 10-806-181, Anatomy/Structure Function)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Heating, Ventilation, Air Conditioning, and Refrigeration Technology

## ASSOCIATE DEGREE - TWO YEARS

Program Code 106011

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Heating, Ventilation, Air Conditioning, and Refrigeration Technology Program will be able to:

- Develop an HVAC/R control circuit
- Troubleshoot HVAC/R control circuits
- Troubleshoot refrigeration systems
- Troubleshoot gas fired heating systems
- Troubleshoot oil fired heating systems
- Troubleshoot commercial and residential HVAC/R systems
- Troubleshoot airflow for HVAC/R systems
- Troubleshoot hydronic HVAC systems
- Use engineering principles to troubleshoot HVAC/R systems
- Use industry standard tools to troubleshoot HVAC/R systems
- Estimate a heating and cooling load
- Communicate HVAC/R service reports for customers
- Prepare for EPA Refrigeration Certification exam

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- High school basic math or equivalent
- NWTC placement exam determines starting level in program

### MATH LEVEL

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 HVAC/R program will have the potential for employment as an HVAC/R Service Technician for a Mechanical Contractor, HVAC/R Facilities Maintenance Department, Equipment Manufacturer or HVAC/R Wholesales, servicing a combination of commercial, industrial, and residential HVAC/R systems.

#### 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:** require the Technician to work 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:** require the Technician to work 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 71 credits.

#### FIRST SEMESTER

Course 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-Introduction	1
	OR	
10-103-121	Micro: Word-Introduction	1
	OR	
10-103-122	Micro: Word-Part 2	1
	OR	
10-103-131	Micro: Excel-Introduction	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
10-804-120	Math-Tech Algebra	3
10-809-199	Psychology-Human Rel	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	Communication-Written	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	Reporting-Technical	3
10-809-197	Society-Amer Contemp	3
	Elective	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
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

This program is fully eligible for financial aid.

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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.

### 10-601-111 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)

### 10-601-113 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. (Prerequisites: 10-601-121, HVAC/R Heating Fundamentals; 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)

### 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)

### 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. (Prerequisites: 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. (Prerequisites: 10-601-121, HVAC/R Heating Fundamentals; 10-601-127, HVAC/R Control Circuits; 10-601-128, HVAC/R Heating Systems)

### 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: 10-601-121, HVAC/R Heating Fundamentals; 10-601-127, HVAC/R Control Circuits; 10-601-113, HVAC/R Refrig/Air Cond Syst; 10-601-128, HVAC/R Heating Systems)

### 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)

### 10-601-141 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. (Prerequisites: 10-601-131, HVAC/R Heating Systems Applications; 10-601-147, HVAC/R Motor/Control Applications; 10-601-143, HVAC/R Refrigeration Applications)

### 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. (Prerequisites: 10-601-131, HVAC/R Heating System Applications; 10-601-147, HVAC/R Motor/Control Applications; 10-601-135, HVAC/R Hydronic System Applications; Corequisite: 10-601-141, HVAC/R Systems Service)

### 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: 10-601-121, HVAC/R Heating Fundamentals; 10-601-127, HVAC/R Control Circuits; 10-601-113, HVAC/R Refrig/Air Cond Syst; 10-601-128, HVAC/R Heating Systems)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Hotel and Restaurant Management

**ASSOCIATE DEGREE - TWO YEARS, PLUS ONE SUMMER**

**Program Code 101092**

Offered at the Green Bay and Sturgeon Bay campuses. Information in Sturgeon Bay: (920) 746-4900. Information in Green Bay: (920) 498-5444.

## 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.

Graduates of this program will be able to:

- 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.
- Develop a personal career plan.
- Manage quality customer service systems.
- Apply product presentation principles in the hospitality industry.

## REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High School graduate or equivalent
- Basic math skills

## MATH LEVEL

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 the program will have the potential for employment in a wide range of positions for a broad variety of hospitality and tourism operations including Front Office Manager, Convention Service Manager, Food Service Manager, Assistant Executive Housekeeper, and Sales Manager.

**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.

**ASSISTANT 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
- Executive Housekeeper
- 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 67 credits.

### FIRST SEMESTER

Course No.	Description	Credits
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-132	Micro: Excel-Part 2	1
10-104-101	Selling Principles	3
10-109-113	Hospitality/Tourism-Intro	3
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>18</b>

### SECOND SEMESTER

10-101-141	Accounting-Financial	3
10-104-110	Marketing Principles	3
10-104-191	Customer Service Mgmt	3
10-109-114	Front Office Management	3
10-801-198	Speech	3
	Elective	2
<b>SEMESTER TOTAL</b>		<b>17</b>

### THIRD SEMESTER

10-109-111	Food Service Sanitation-App	1
10-109-125	Food Service Mgmt	3
10-109-127	Housekeeping/Facilities Mgmt	3
10-109-190	Hospitality Portfolio	1
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	Elective	2
<b>SEMESTER TOTAL</b>		<b>16</b>

### FOURTH SEMESTER

10-104-189	Sales Management	3
10-109-126	Food/Lodging Cost Control	3
10-109-142	Hospitality Law/Liabil	3
10-109-151	Special Events Planning	2
10-109-165	Hospitality Tourism-Intern	3
	Elective	2
<b>SEMESTER TOTAL</b>		<b>16</b>

**SUGGESTED ELECTIVES:** Hospitality Marketing (10-109-146), Beverage Management (10-109-164), Hospitality Purchasing (10-109-167)

This program is fully eligible for financial aid.

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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.

**10-104-101 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.

**10-104-189 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.

**10-109-111 FOOD SERVICE SANITATION-APPLIED** ...contamination/foodborne illness, safe food handler, food safety systems, purchasing, receiving, storage, preparation, serving, facilities, equipment, cleaning and sanitation, cleaning program, pest control, accident prevention, crisis management, sanitation regulations/standards.

**10-109-113 HOSPITALITY/TOURISM-INTRO** ...scope of industry, career planning, restaurant segments, food service operations, institutional food service, lodging segments, lodging operations, current issues/forces, tourism industry components, destinations, transportation, role of service, future considerations.

**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.

**10-109-125 FOOD SERVICE MGMT** ...cooking methods, tools/equipment, menu planning, staff scheduling and supervision, controlling costs, facilities maintenance and cleaning, recipe standardization.

**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.

**10-109-142 HOSPITALITY LAW/LIABILITY** ...hospitality laws and regulations, duty to receive patrons, duty to protect patrons, crimes, employment law, contracts, property rights, forms of business organization, attorney relationship, settlement of legal disputes.

**10-109-151 SPECIAL EVENTS PLANNING** ...special event marketing, promotions meeting target markets, contract details and considerations, function preparations, special equipment and service needs, staging the event. Students will achieve certification from the Educational Institute of the American Hotel and Motel Association.

**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.

**10-109-190 HOSPITALITY PORTFOLIO** ...portfolio development process, documentation, production assembly and presentation.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Individualized Technical Studies

Program Code 108251

## ASSOCIATE DEGREE - FULL-TIME, PART-TIME

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-6872. Toll free: (800) 422-NWTC.

### 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.

The Individualized Technical Studies 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. See the Accuplacer section of this catalog for more information.

- Good reading, writing, and math skills
- Math and reading assessments
- Completion of all recommended activities to address math and reading skills deficiencies

### MATH LEVEL

Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog. Selection of specific courses within a program may have higher-level math requirements and should be discussed with the program counselor.

### 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.

### CURRICULUM

Total credits for the Individualized Technical Studies program will range from 64-72 credits depending on the personal program portfolio selected. Admission to the program must be approved prior to completion of 32 credit hours.

#### Program requirements must include:

**Individualized Technical Studies Core** **Credits 40-48**

A minimum of 40 credits of individualized technical studies is required and may be drawn from all divisions of the college. A minimum of 20 credits must be focused on one discipline. The selection of courses must be relevant to the student's career goals and should provide sufficient hours of concentration in one or two specific technical areas to ensure technical competence in achieving the desired occupational goals. Prerequisites must be met.

#### Communications (Select at least two) **6**

Course No.	Description	Credit
10-801-195	Communication-Written	3
10-801-196	Communication-Oral/Interpersonal	3
10-801-197	Reporting-Technical (Prerequisite: Written Communication)	3
10-801-198	Speech	3

#### Social Science (Select at least one) **3**

10-809-195	Economics	3
10-809-196	Introduction to Sociology	3
10-809-197	Contemporary American Society	3

#### Behavioral Science (Select at least one) **3**

10-809-198	Introduction to Psychology	3
10-809-199	Psychology - Human Relations	3

*Select 3 additional credits from the above list to complete the General Education course requirements.* **3**

#### Math/Science Requirements (Select one) **3**

10-804-120	Tech Algebra	3
10-804-130	Algebra/Trigonometry	3
10-806-150	Physics 1-Technical	3
10-806-177	Anatomy/Physiology-General	4
10-804-101	Business Math	3
	<b>Elective</b>	<b>3</b>
	<b>Elective</b>	<b>3</b>

**Total Program Credits 64-72**

This program is fully eligible for financial aid.

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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.

**10-801-195 COMMUNICATION-WRITTEN** ...the nature and scope of technical writing, document design, graphics, ethics of the writing process, definition, description, memos, business letters, resume and cover letter, instructions, summaries, and short reports.

**10-801-196 COMMUNICATION-INTERPERSONAL** ...the communication process, perception and self-concept, language, listening, nonverbal communication, interpersonal relationships, communication in groups and public communication; prepare and deliver two speeches and one group presentation.

**10-801-197 REPORTING-TECHNICAL** ...principles of report writing and correspondence, proposals, feasibility reports, progress reports, investigation reports, evaluation reports, meeting reports, memos, and correspondence. (Prerequisite: 801-195)

**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.

**10-809-195 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 AMERICAN SOCIETY** ...the major social institutions within the American society: government, family, education, religion, and economic system.

**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.

**10-809-199 PSYCHOLOGY-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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Individualized Technical Studies - Journeyworker

Program Code 104995

## ASSOCIATE DEGREE - FULL-TIME, PART-TIME

Offered at the Green Bay campus, Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-6872. Toll free: (800) 422-NWTC

### PROGRAM DESCRIPTION

The 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-two 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.

The Occupational Specific courses may be selected from career areas such as accounting, architectural technology, automotive technology, civil engineering technology, corrections science, electronics, financial institutions management, fire protections engineering technology, heating, ventilation, air conditioning and refrigeration technology, landscape horticulture technician, logistics, or other areas of specific interest.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. See the Accuplacer section of this catalog for more information.

- Good reading, writing, and math skills
- Math and reading assessments
- Completion of all recommended activities to address math and reading skills deficiencies

### MATH LEVEL

Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog. Selection of specific courses within a program may have higher-level math requirements and should be discussed with the program counselor.

### 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

Total credits for the Individualized Technical Studies-Journeyworker = 64 credits.

#### REQUIRED PROGRAM COMPONENTS Credits

**Wisconsin Journey Certificate 32**  
We require 32 credits in occupational specific courses. Advanced standing will be granted for the 32 credits with the completion of the apprenticeship if it includes a minimum of 400 hours of paid related training (day school).

#### GENERAL EDUCATION 15

**Communication-Select two**  
10-801-195 Communication-Written 3  
10-801-196 Communication-Interpersonal 3  
10-801-197 Reporting-Technical 3  
10-801-198 Speech 3

**Social Science-Select one**  
10-809-195 Economics 3  
10-809-196 Introduction to Sociology 3  
10-809-197 Contemporary American Society 3

**Behavioral Science-Select one**  
10-809-198 Introduction to Psychology 3  
10-809-199 Psychology-Human Relations 3

**Select one additional course from the list above 3**

**OCCUPATIONAL SUPPORT & ELECTIVES 17**  
Complete 11 supportive and 6 elective course credits. A three-credit (minimum) math or science class must be included as part of the 17 credits. Advanced standing for a maximum of 8 of these 17 credits will be granted for the required apprentice related instruction beyond the 400 hours statutory minimum.

#### TOTAL PROGRAM CREDITS 64

The remaining courses may be selected from associate degree career areas such as accounting, corrections science, dental hygienist, electronics, financial institutions management, healthcare business services, hospitality and tourism management, laboratory technician, marketing, mechanical design technician, or other areas of special interest.

This program is fully eligible for financial aid.

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## COURSE DESCRIPTIONS

These courses provide the opportunity for the student to develop the knowledge, skills, and understanding of:

**10-801-195 COMMUNICATION-WRITTEN** ...the nature and scope of technical writing, document design, graphics, ethics of the writing process, definition, description, memos, business letters, resume and cover letter, instructions, summaries, and short reports.

**10-801-196 COMMUNICATION-INTERPERSONAL** ...the communication process, perception and self-concept, language, listening, nonverbal communication, interpersonal relationships, communication in groups and public communication; prepare and deliver two speeches and one group presentation.

**10-801-196 REPORTING-TECHNICAL** ...principles of report writing and correspondence, proposals, feasibility reports, progress reports, investigation reports, evaluation reports, meeting reports, memos, and correspondence. (Prerequisite: 801-195)

**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.

**10-809-195 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 AMERICAN SOCIETY** ...the major social institutions within the American society: government, family, education, religion, and economic system.

**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.

**10-809-199 PSYCHOLOGY-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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Industrial Mechanic

Program Code 314622

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Industrial Mechanic prepares students to evaluate machine performance, identify trouble areas, and repair systems.

Graduates of the Industrial Mechanic Program will be able to:

- Interpret the elements of mechanics.
- Use measuring devices.
- Use hand, stationary, and portable power tools.
- Prepare mounting bases for machine installation.
- Identify threaded fasteners and various locking and holding devices.
- Identify types of structural steel shapes.
- Apply safety requirements to rigging an object.
- Install pipe.
- Classify valves used in a piping system.
- Describe the difference between machine, carbon, and alloy steels.
- Identify types of bearings.
- Apply lubricants.
- Demonstrate parallel shaft alignment.
- Use chain drive component terminology.
- Identify types of gears.
- Identify types of couplings.
- Use electrical motors.
- Identify pipe classifications, demonstrate correct pipe assembly and installation procedures.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High school background in mathematics, science, and industrial education

### MATH LEVEL

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 an Industrial or Maintenance Mechanic, Machine Adjuster, Machine Assembler, Machinery Erector, and Machinery Repairer.

### 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 34 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
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
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>18</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>

This program is fully eligible for financial aid.

## 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. (Prerequisite: 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. (Prerequisite: 31-462-307, Mechanic 3-Industrial)

**31-462-356 HYDRAULICS-INDUSTRIAL** ...hydraulic/pneumatic system maintenance, hydraulic pump repair, motors, controls, actuators, and pneumatic components.



Descriptions of courses not found on this page can be found in the back of the catalog.

# Instructional Assistant - Advanced

Program Code 105222

## ASSOCIATE DEGREE - TWO YEARS

Offered Online. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-6373. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Instructional Assistant-Advanced Degree 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, clerical and other tasks related to instruction. This program meets Title I requirements.

Duties may also include monitoring student activities, assisting with reading, 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, and supervise various classroom and other school events. Instructional Assistants may be hired to provide instructional services to students from pre-kindergarten through high school, however, the focus of this program is on preparing graduates to work primarily in elementary and middle level schools.

Graduates of the Instructional Assistant-Advanced Program will be prepared to:

- Implement instructional strategies to support all student learning.
- Assist all students in maintaining appropriate behaviors in individual and group settings.
- Communicate effectively with students, school staff, and others.
- Carry out school and classroom policies, procedures, and tasks.
- Utilize a variety of instructional media and technology.
- Provide for the health and safety needs of students.
- Assume responsibility for ethical, moral, and legal practices.
- Fulfill role responsibilities of the position in relation to school staff and students.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information. Students must have:

- A high school diploma or equivalency
- Demonstrated proficiency in basic skills through a course placement assessment
- Proper immunizations prior to beginning practicum classes

### MATH LEVEL

Students should have mastered basic math before entering this program. For a description of basic math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

Most job opportunities in this field coincide with the public school system with regard to workday, holidays, and summers.

A graduate of the program will have potential for employment as an instructional assistant or educational paraprofessional in schools from the pre-kindergarten through high school level. Paraprofessionals work with children in early care and education settings, preschools, elementary schools, middle schools, and high schools. Some educational paraprofessionals work with children with special needs.

**TYPICAL ACTIVITIES INCLUDE:** Preparing classroom displays and media, using computers, supervising classroom and playground activities, giving tests, monitoring students, reading and telling stories, assisting children in a variety of ways.

**NOTE: A STUDENT WHO DOES NOT MEET THE ABOVE REQUIREMENTS** is required to consult an NWTC Counselor about ways to make up deficiencies through testing or course work.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us)

**SPECIAL NOTE:** Enroll in this program as a full-time or part-time student. General Education courses in this program may be taken online, face-to-face, accelerated or TCA (video). In addition, advanced standing may be available to students who can document their work experience through the portfolio process. Contact the division to schedule an appointment to review your individual situation.

### CURRICULUM

The Instructional Assistant-Advanced Associate Degree is a two-year program. Upon graduation, a student will have completed 64 credits. Courses are offered online, and may be taken in any order as long as prerequisites are met. Below is a suggested timeline.

#### Take these classes in any order:

Course No.	Description	Credits
10-522-103	Intro to Educational Practices	3
10-522-106	Child/Adolescent Development	3
10-522-102	Techniques for Read/Lang Arts	3
10-522-111	Guiding & Managing Behavior	3
10-522-101	Teamwork in the School Setting	3
10-522-107	Overview of Special Education	3
* 10-522-105	Practicum #1	2
10-522-112	Techniques for Math/Science	3
10-522-116	Technology for Instructional Assist.	3
10-522-113	Media & Computer Resources	2

#### These classes have prerequisites. Take as directed.

* 10-522-115	Practicum #2	2
10-522-122	Advanced Read/Language Arts	3
10-522-123	Positive Class Management Tech	2
* 10-522-125	Practicum #3	2
10-522-124	Supporting Students with Disabilities	3

#### General Studies Classes—take in any order.

10-801-195	Written Communication	3
10-801-196	Oral/Interpersonal Communications	3
10-809-198	Psychology-Intro	3
10-809-195	Economics	3
10-809-196	Sociology-Intro	3
10-804-130	Math-Algebra/Trigonometry	3
	OR	
10-804-101	Math-Business	3
	Electives – Your Choice	6

\* Required: Student teaching in the community.

**NOTE:** It is necessary to show good health as evidenced by a medical examination within three months prior to beginning practicum classes.

For further details, call (920) 498-6373.

This program is fully eligible for financial aid.

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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.

### **10-522-101 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 TECHNIQUES FOR 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 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.

**10-522-105 PRACTICUM 1** ...portion 1 of practicum/field experience.

### **10-522-106 CHILD AND ADOLESCENT**

**DEVELOPMENT** ...provides an overview of 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 OVERVIEW OF SPECIAL EDUCATION**

...provides training in the classifications of special education, K-12. Studies include causes of special needs and intervention strategies. Examines key development milestones and how they relate to physical, mental, emotional or social development of children.

### **10-522-111 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.

### **10-522-112 TECHNIQUES FOR MATH/SCIENCE**

...assisting the classroom teacher in group and individual tutoring activities in arithmetic, science, and math. Discusses current classroom support materials and available software.

**10-522-115 PRACTICUM 2** ...portion 2 of practicum/field experience. Prerequisite: 10-522-105.

### **10-522-113 MEDIA AND COMPUTER**

**RESOURCES** ...provides training in the operation of VCR's, Elmo, video equipment, overhead projectors, tape recorders and computers. Includes hands-on experience with instructional resources such as the learning centers, software and other instructional aids that enhance student learning.

### **10-522-122 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.

### **10-522-123 POSITIVE CLASSROOM**

**MANAGEMENT** ...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 with an emphasis on prevention. Prerequisite: 10-522-111.

### **10-522-124 SUPPORT STUDENTS-DISABILITIES**

...strategies to manage the learning environment proactively to prevent behavior problems and promote learning for students with developmental disabilities. Prerequisite: 10-522-107.

**10-522-125 PRACTICUM 3** ...portion 3 of practicum/field experience. Prerequisites: 10-522-115 and 10-522-105.

### **10-522-126 TECHNOLOGY FOR INSTRUCTIONAL**

**ASSISTANTS** ...worksheets, tests, letters, posters, brochures, presentations while learning selected software. Incorporation of images into documents from a variety of sources including digital cameras/scanners.

# Jewelry Repair and Fabrication

Program Code 314411

## TECHNICAL DIPLOMA - NINE MONTHS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC. Visit the Jewelry Repair and Fabrication Web site at [www.nwtc.edu](http://www.nwtc.edu).

### 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.

Graduates of the Jewelry Repair and Fabrication Program will be able to:

- Perform basic bench jewelry tasks/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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other test.)
- Basic math defined as addition, subtraction, multiplication and division.

### MATH LEVEL

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

A graduate of the program will have the potential for employment as a Bench Jeweler, Goldsmith, Stone Setter, Silversmith, Jewelry Sales Representative and Jewelry Designer. Graduates in these occupations repair and/or fabricate jewelry according to customer and/or owner specifications.

**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.**

- Certified Gemologist
- Graduate Gemologist
- Appraiser
- Gold Metallurgist
- Hand Engraver
- Trade Shop Owner
- Jewelry Department Manager
- Jewelry Store Owner
- Jewelry Equipment Representative

### CURRICULUM

The Jewelry Repair and Fabrication Technical Diploma is a nine month, two-semester program. Upon graduation, a student will have completed 33 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-121	Micro: Word-Introduction OR	1
10-103-131	Micro: Excel-Introduction OR	1
10-103-151	Micro: PowerPoint-Intro	1
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
31-441-314	Precious Metals	1
31-441-317	Gemology 1	2
31-801-386	Communicating Effectively	1
<b>SEMESTER TOTAL</b>		<b>16</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
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

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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.

**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. (Prerequisite: 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 hears, 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. (Prerequisite: Completion of 1st semester)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Landscape Horticulture Technician

Program Code 100014

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Landscape Horticulture Technician program prepares a student for employment in the horticulture industry. (Instruction will focus on landscape designing and building skills.)

Graduates of the Landscape Horticulture Technician Program will be able to:

- 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.
- Use masonry hand and power tools.
- Safely operate landscape equipment.
- Design and install irrigation equipment.
- Operate computer hardware system.
- Develop and deliver a landscape design presentation.
- Use CAD (Computer Aided Design).
- Receive training for Wisconsin Pesticide Certification
- Propagate and grow horticultural plants.
- Diagnose and treat pest problems on ornamental plants.
- Identify and maintain tropical indoor plants.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

### MATH LEVEL

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 this program will have the potential for employment as a Landscape Horticulture Technician in a variety of settings.

### 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, a graduate may find employment as:

- 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 69 credits.

### FIRST SEMESTER

Course No.	Description	Credits
10-001-110	Horticulture-Intro	3
10-001-158	Plant-Woody Ornamental 1	3
10-001-159	Flowers-Herbaceous 1	3
10-001-172	Landscape Maintenance	2
10-606-112	Engineering Applications	1
10-606-121	Sketching-Landscape	2
10-801-196	Oral/Interpersonal Comm	3
<b>SEMESTER TOTAL</b>		<b>17</b>

### SECOND SEMESTER

10-001-120	Plant Nutrition/Fertilizers	1
10-001-153	Plant Culture/Soil Fund	3
10-001-154	Turf Management 1	3
10-001-180	Landscape Construction 1	2
10-606-125	CAD-Landscape	2
10-804-120	Math-Tech Algebra	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>17</b>

### THIRD SEMESTER

10-001-170	Pest Management-Integrated	2
10-001-174	Landscape Design Fund 1	3
10-001-181	Landscape Construction 2	3
OR		
10-001-121	Plant Propagation	3
10-104-191	Customer Service Mgmt	3
10-801-195	Communication-Written	3
Elective		3
<b>SEMESTER TOTAL</b>		<b>17</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 2	3
OR		
10-001-130	Plant-Interior	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
Elective		3
<b>SEMESTER TOTAL</b>		<b>18</b>

**SUGGESTED ELECTIVES:** Golf Course Management (10-001-150), Horticulture Internship (10-001-151), Survey Site Development (10-607-107).

This program is fully eligible for financial aid.

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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.

### 10-001-110 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

...utilizing sketching, landscape 3D CAD design software, develop and build models to scale featuring in-detail land topography, buildings, hardscape, and plants for presentation. (Prerequisite: total of 30 credits in Landscape/Horticulture classes successfully completed)

### 10-001-120 PLANT NUTRITION/FERTILIZERS

...nutritional needs of turfgrasses and ornamentals, special emphasis will be placed on various types of fertilizers and fertilizer programs.

### 10-001-121 PLANT PROPAGATION

...plant propagation and production techniques. (Prerequisite: 10-001-110, Intro to Horticulture)

### 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. Learn the difference between signs and symptoms and identification of problem plants. (Prerequisite: 10-001-110, Intro to Horticulture)

### 10-001-154 TURF MANAGEMENT 1

...identification of turf grass; maintenance and establishment of various turf grasses according to planned use; problems associated with home lawns, golf courses, other use areas; also maintenance practices. (Prerequisite: 10-001-110, Intro Horticulture)

### 10-001-158 PLANT-WOODY ORNAMENTAL 1

...physiology, culture, identification, and use of primarily temperate woody plant materials appropriate for landscapes in northeastern Wisconsin.

### 10-001-159 FLOWERS-HERBACEOUS 1

...annuals/perennials/roses; using flowers/foilage effectively in the landscape; care of each flower emphasizing selection/tips to best utilize each flower; groundcover/vines included.

### 10-001-170 PEST MANAGEMENT-INTEGRATED

...various methods to combat plant pests in an environmentally responsible manner; techniques and strategies. (Prerequisite: 10-001-110, Intro to Horticulture; 10-001-154, Turf Management 1)

### 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.

### 10-001-174 LANDSCAPE DESIGN

**FUNDAMENTALS 1** ...residential design methods utilizing outdoor room concepts: function, design principles, and composition in developing a landscape plan; drafting, site analysis, graphics. (Prerequisite: 10-606-121, Landscape Sketching)

### 10-001-180 LANDSCAPE CONSTRUCTION 1

...site conditions, landscape tools, design plan implementation. (Prerequisite: 10-606-112, Engineering Application; 10-606-121, Sketching Landscape)

### 10-001-181 LANDSCAPE CONSTRUCTION 2

...working with landscape construction methods. (Prerequisite: 10-001-180, Landscape Construction 1)

### 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 2

...design and detail landscape projects with construction documents and estimates. Focus on specialty landscape. (Prerequisite: 10-001-174, Landscape Design 1)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Machine Tool Operation Program Code 314201

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay and Marinette campuses. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Machine Tool Operation prepares students to operate machine tools such as engine lathes, milling machines, drill presses, and computer numerical control machines.

Graduates of the Machine Tool Operation Program will be able to:

- Be successfully employed in the trade.
- Safely setup and operate drill presses.
- Safely setup and operate engine lathes.
- Safely setup and operate horizontal and vertical milling machines.
- Safely setup and operate grinding machines.
- Safely setup, operate, and program computer numerical control milling machines.
- Safely setup, 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.

Graduates of the Machine Tool Operation program have the option of continuing with the second year of the CNC Technician (Green Bay campus) or the Machine Tool Technicians (Marinette) programs.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

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 Computer Numerical Controlled (CNC) Operator, Machine Set-Up Operator, Machine Tool Operator, Machinist, or Maintenance Machinist.

**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

### 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

Course No.	Description	Credits
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
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>17</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
31-804-302	Math 2-Trades	1
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

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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.

**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.

**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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Machine Tooling Technics Program Code 324205

## TECHNICAL DIPLOMA - TWO YEARS

Offered at the Marinette campus. Admissions, registration, or counselor, and course information: (715) 735-9361. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

A second year of advanced CNC, tool and die, and electrical discharge machining for graduates of the Machine Tool Operation Program.

Graduates of the Machine Tooling Technics Program will be able to:

- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### PROFILE OF INCOMING STUDENTS

- Problem solvers
- Likes to work with hands
- Able to organize information
- Accurate with numbers
- Able to work with deadlines
- Creative thinkers

### EMPLOYMENT POTENTIAL

A graduate of the program will have the potential for employment as a Computer Numerical Controlled (CNC) Operator, Jig and Fixture Apprentice/Trainee, Machine Set-Up Operator, Machinist Apprentice/Trainee, Maintenance Machinist, Mold Maker Apprentice/Trainee, Tool and Cutter Grinder, Tool and Die Apprentice/Trainee, and Electrical Discharge Machining (EDM) Operator.

**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 Tooling Technics program is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
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
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>17</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
31-804-302	Math 2-Trades	1
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

31-442-350	Welding-Machine Trades	2
31-804-303	Math 3-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
32-420-332	CNC Fundamentals 3	2
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

31-809-301	Social Science Survey	2
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>17</b>

This program is fully eligible for financial aid.

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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.

**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.

**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.

**31-442-350 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.

**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.

**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.

**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. (Prerequisite: 32-420-303, Tooling Design; 32-420-301, Tool Making)

**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. (Prerequisite: 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)

**32-420-332 CNC FUNDAMENTALS 3** ...CNC production planning, advanced 2-D mill programming, 3-D surface programming for CNC milling, conversational and G-code programming for milling machines, and computer assisted CNC programming for milling operations. (Prerequisites: 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: 32-420-332, CNC Fundamentals 3)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Marketing Program Code 101043

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus, with an 18-month accelerated format also available for individuals with employment experience.

Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### 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.

Graduates of this program will be able to:

- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Ability to use computer keyboard

### MATH LEVEL

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 as Customer Service Representative, Marketing Assistant, Marketing Research Assistant, Sales Promotion Coordinator, or Sales Representative.

#### 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

Course No.	Description	Credits
10-102-158	Business-Intro	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-141	Micro: Access-Intro	1
10-104-101	Selling Principles	3
10-104-110	Marketing Principles	3
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-104-107	Marketing Comm-Integrated	3
10-104-124	Marketing Applications-PC	1
10-104-191	Customer Service Mgmt	3
10-104-198	Market Research	3
10-801-198	Speech	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

10-101-141	Accounting-Financial	3
10-104-120	Marketing Info Mgmt	3
10-182-157	Logistics/Supply Chain Mgmt	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

10-102-150	Law-Business	3
10-104-134	Marketing Internship	3
	OR	
10-104-140	Marketing Field Study	3
10-104-143	Marketing-Direct	3
	OR	
10-104-119	E-Commerce Web Marketing	3
10-104-189	Sales Management	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>15</b>

**SUGGESTED ELECTIVES:** International Marketing (10-138-155), Consumer Behavior (10-104-176), Selling Techniques-Advanced (10-104-181).

This program is fully eligible for financial aid.

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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.

### **10-102-158 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.

**10-104-101 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-COMMERCE 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.

**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.

**10-104-134 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.

**10-104-143 MARKETING-DIRECT** ...interactive technology, direct marketing vs. general advertising, market segmentation through databases, renting prospect lists, print and broadcast media copy, direct mail, catalogs, telemarketing skills, and script writing.

**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.

**10-182-157 LOGISTICS/SUPPLY CHAIN MANAGEMENT** ...supply chain management, purchasing, integrated logistics, customer service, service response logistics, domestic transportation, traffic management, inventory management, warehouse management, materials handling/packaging, reverse logistics, international logistics.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Marketing and Graphic Communications

Program Code 101117

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Marketing and Graphic Communications trains students in one of three specialized clusters: Design, Print Production, and Web/Multimedia. Students complete a portfolio review session with the instructional team to advise on cluster selection during each semester.

Graduates of the Design cluster will be able to:

- Conduct marketing plans.
- Implement promotional strategies.
- Create designs for print and multimedia.
- Assemble a professional portfolio.

Graduates of the Print Production cluster will be able to:

- Perform electronic prepress operations.
- Operate printing equipment.
- Produce four color process and spot color separations.
- Perform digital publishing operations.
- Assemble a professional portfolio.

Graduates of the Web Multimedia cluster will be able to:

- Create web pages.
- Produce digital video.
- Implement different multimedia delivery methods.
- Assemble a professional portfolio.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard

### MATH LEVEL

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 Desktop Publisher, Graphic Designer, Advertising Assistant, Commercial Art Worker, Layout Designer, Multimedia Specialist, Printing Support Worker, Public Relations Assistant, Pre-Press Technician, Web Animation or Website Designer.

**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.

**LAYOUT DESIGNER:** designs basic plans for print advertising, passes on work to a commercial artist or copywriter, and is responsible for final electronic files.

**MULTIMEDIA SPECIALIST:** create digital media elements for web, broadcast, and CD/DVD delivery.

**PRINTING SUPPORT WORKER:** handles electronic and traditional pre-press operations including process cameras, PMT processing, stripping negatives, plate making, evaluating halftones, color separations, contact printing, special effects halftone production, 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.

**WEB ANIMATION:** program digital animation for use in web and multimedia delivery.

**WEBSITE DESIGNER:** build 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. Learners are required to meet with a counselor or with the instructional team to advise on cluster selection. Upon graduation, a student will have completed 67 credits.

### ALL STUDENTS COMPLETE:

Course No.	Description	Credits
10-104-107	Marketing Comm-Integrated	3
10-111-101	Macintosh-Image Editing	3
10-111-103	Graphic Workstations	1
10-111-111	Marketing 1-Visual Design	3
10-111-120	Macintosh Publishing	3
10-111-125	Graphic Reproduction Tech	3
10-111-141	Marketing Comm Internship	3
10-111-159	Graphic Workstations-Adv	3
10-111-161	Macintosh Illustration	3
10-111-162	Typography Design/Paper	2
10-111-170	Graphic Design Portfolio	1
10-204-110	Publishing Technologies	3
10-801-195	Communication-Written	3
10-801-196	Oral/Interpers Communication	3
10-804-101	Math-Business	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
10-809-199	Psychology-Human Rel	3
	Elective	3
	Elective	3
	<b>TOTAL CREDITS</b>	<b>55</b>

### STUDENTS SELECT ONE OF THE FOLLOWING COURSE CLUSTERS:

#### PRINT PRODUCTION

10-111-142	Graphic Reproduction-Adv	2
10-111-164	Page Layout-Adv	1
10-204-111	Digital Publishing Operations	3
10-204-120	Publishing Operations-Offset	3
10-204-122	Digital Publishing Systems	3
	<b>TOTAL CREDITS</b>	<b>12</b>

#### DESIGN

10-104-191	Customer Service Mgmt	3
10-111-110	Macintosh Image Editing-Adv	3
10-111-121	Marketing 2-Visual Design	3
10-801-197	Reporting-Technical	3
	<b>TOTAL CREDITS</b>	<b>12</b>

#### WEB MULTIMEDIA

10-111-150	Web Graphic Design	3
10-111-151	Website Design	3
10-111-152	Web Animation Design	3
10-111-154	Macintosh Multimedia Authoring	3
	<b>TOTAL CREDITS</b>	<b>12</b>

**SUGGESTED ELECTIVE(S):** Portable Document Publishing (10-111-163). Depends on cluster selection. Consult with a counselor or instructional team for recommendations.

This program is fully eligible for financial aid.

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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.

### **10-111-101 MACINTOSH-IMAGE EDITING**

...explore the software application of Adobe Photoshop; scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print or on the internet. An introduction to manipulating bitmap images.

**10-111-103 GRAPHIC WORKSTATIONS** ...computer operating system, basic computer hardware, and basic computer software.

### **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.

**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.

**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.

### **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.

### **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.

**10-111-150 WEB GRAPHIC DESIGN** ...(Adobe ImageReady+Acrobat+BBedit) internet protocols, website navigation, information architecture and page structure, interface design, optimizing web graphics, GIF animation, prototyping interfaces, and testing browser compatibility. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-101, Macintosh-Image Editing)

**10-111-151 WEBSITE DESIGN** ...(Adobe Go-Live +Acrobat) format text for websites, build DHTML animation, internet based forms, cascading style sheets, CSS, web publishing, browser testing, and basic site management. (Prerequisites: 10-111-161, Macintosh Illustration and 10-111-150, Web Graphic Design)

**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.

### **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.

### **10-111-170 GRAPHIC DESIGN PORTFOLIO**

...define portfolios, evaluate current projects, produce artifacts for portfolio, and raise/strike portfolio exhibit. Course should be taken during the final semester.

### **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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Mechanical Design Technician

Program Code 106061

## ASSOCIATE DEGREE - TWO YEARS PLUS ONE SUMMER

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Mechanical Design Technician 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.

Graduates of the Mechanical Design Technician Program will be able to:

- 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 CAM 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.

### MATH LEVEL

Students should have mastered algebra skills before entering this program. 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 as Detailer, Mechanical Design Technician, and Mechanical Drafter.

**DETAILER:** produces detailed drawings of parts of machines from supplied information on CAD, makes drawing changes to comply with Engineering Change Notices (ECN's)/ Engineering Change Requests (ECR's). Works under close supervision.

**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 on a CAD system; and may specialize in a specific type of machine or product.

**MECHANICAL DRAFTER:** has the principal duty of preparing working drawings of machinery and mechanical devices using CAD systems and drafts 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- A high school background in mathematics, science, and industrial education
- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- 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 Technician Associate Degree is a two-year plus one summer, five-semester program. Upon graduation, a student will have completed 72 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-606-111	Mechanical Design-Exploring	1
10-606-113	CAD	2
10-606-119	Sketching-Technical	2
10-606-162	Solidworks Fundamentals	1
10-801-196	Oral/Interpersonal Comm	3
10-804-150	Math 1-Tech	5
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-420-111	Manufacturing Tech 1	4
10-606-122	CAD-Mechanical	3
10-606-126	Geometric Dimension/Toleran	2
10-804-160	Math 2-Tech	4
10-806-150	Physics 1-Technical	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SUMMER SEMESTER

10-801-195	Communication-Written	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>6</b>

#### FOURTH SEMESTER

10-420-121	Manufacturing Tech 2	4
10-606-135	Machine Members-Strength	5
10-606-137	Geometry-Descriptive	3
10-606-139	CAD-Electrical Control	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FIFTH SEMESTER

10-419-170	Fluid Power	3
10-606-141	Design Problems	3
10-606-143	Mechanisms	3
10-801-197	Reporting-Technical	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>15</b>

**SUGGESTED ELECTIVES:** Solidworks Intermediate (10-106-163), Solidworks Assemblies and Drawings (10-106-164), Solidworks Sheet Metal (10-606-165), Solidworks Loft/Surface (10-606-166), Physical Metallurgy (10-806-171).

This program is fully eligible for financial aid.

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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.

### 10-420-111 MANUFACTURING TECHNIQUES 1

...safety and considerations, quality assurance, drilling, turning/boring, broaching/sawing, milling/grinding, engineering materials-metals, heat treatment, traditional casting process, and contemporary casting processes.

### 10-420-121 MANUFACTURING TECHNIQUES 2

...welding methods, mechanical fastening, adhesive joining, non-metal engineering materials, material forming concepts, non-traditional machining methods, automated machining methods, automated assembly methods, flexible manufacturing concepts, tool and fixturing concepts, and CIM. (Prerequisite: 10-420-111, Manufacturing Techniques 1)

### 10-606-111 MECHANICAL DESIGN-EXPLORING

...philosophy/organization/procedure of the Mechanical Design Technician Program, brief overview of the engineering profession by involvement in a design project to illustrate basic concepts/methods of machine 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: 10-606-119, Sketching-Technical; Prerequisite: Familiarity with Windows file management)

**10-606-119 SKETCHING-TECHNICAL** ...graphically describe objects without CAD system or mechanical drawing aids; fundamental components of design process: lettering, geometric construction, orthographic projection, isometric sketching, section views, auxiliary views, and dimensioning.

**10-606-122 CAD-MECHANICAL** ...auxiliary views, section views, intersections and developments, sheetmetal developments, welding drawings, design and working drawings, conventional dimensioning and tolerancing. (Prerequisite: 10-606-113, Computer Aided Drafting)

### 10-606-126 GEOMETRIC DIMENSIONING/

**TOLERANCING** ...basic review, geometric 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, Computer Aided Drafting; 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: 10-804-160, Math 2-Technical; 10-806-150, Physics 1-Technical)

### 10-606-137 GEOMETRY-DESCRIPTIVE

...orthographic projection, primary auxiliary views, points, lines, planes, successive auxiliary views, piercing points, intersection of planes and dihedral angles, parallelism and perpendicularity, angles between lines and planes, revolutions, and vectors. (Prerequisites: 10-606-122, Computer Aided Drafting-Mechanical; 10-606-162, Solidworks Fundamentals)

### 10-606-139 CAD-ELECTRICAL CONTROL

...draw and wire circuits, draw and develop simple PLC logic and schematics, draw and utilize components in control circuits, develop and draw control logic from written specification.

**10-606-141 DESIGN PROBLEMS** ...data gathering, mathematics, and document standard practices.

(Prerequisites: 10-606-126, Geometric Dimensioning/Tolerancing; 10-606-135, Machine Members-Strength; 10-606-122, CAD Mechanical)

### 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: 10-606-122, CAD-Mechanical; 10-806-150, Physics 1-Technical)

### 10-606-162 SOLIDWORKS FUNDAMENTALS

...terminology, software operation and interface, creating basic models, casting and forging models. (Prerequisites: 10-606-119, Sketching-Technical; Familiarity with Windows file management)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Mecomtronics/Automation Engineering Technology

(MEchanics + COMputers and COMmunications + elecTRONICS)

Program Code 106641

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5622. Toll free: (800) 422-NWTC.

The Mecomtronics/Automation Engineering Technology program responds to industry's need for system-level technicians who can work with integrated machine systems that might involve MEchanical, 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.

### EMPLOYMENT POTENTIAL

Employment opportunities are available in the fields of electronics, pharmaceuticals, food, health, telecommunications, manufacturing, computers, packaging and transportation.

### REQUIREMENTS FOR PROGRAM ENTRY

Graduates of the Mecomtronics program will be able to:

- 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 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.
- 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.

### MATH LEVEL

Students should have mastered algebra skills before entering this program. First semester 10-804-131, Algebra-Intermediate has a prerequisite: 10-804-130, Algebra/Trigonometry. For a description of basic math, see the Basic Education section of this catalog.

### CURRICULUM

The Mecomtronics/Automation Engineering Technology Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-620-110	Electromech Fundamentals 1	1
10-620-111	Electromech Fundamentals 2	1
10-620-121	Mechanics 1: Basic	1
10-660-101	Digital 1: Logic	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
10-804-131	Math-Algebra/Inter	3
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-620-100	Fluids 1: Basic Pneumatics	1
10-620-101	Fluids 2: Basic Hydraulics	1
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
10-664-102	Automation 3: PLC	1
10-664-103	Automation 4: PLC	1
10-664-104	Automation 5: PLC	1
10-664-105	Automation 6: PLC	1
10-801-195	Communication-Written	3
10-804-132	Math-Geometry/Analytic	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### THIRD SEMESTER

10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Circuits	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
10-664-150	Automation 7: PLC	1
10-664-151	Automation 8: HMI	1
10-664-152	Automation 9: HMI	1
10-664-160	Control 1: Transducers	1
10-664-161	Control 2: Fundamentals	1
10-664-162	Control 3: Servo Systems	1
10-809-195	Economics	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

10-664-153	Automation 10: Network	1
10-664-154	Automation 11: Network	1
10-664-155	Automation 12: Advanced	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
10-664-179	Manufacturing Systems	2
10-664-189	Automation Systems Integration	3
10-801-197	Reporting-Technical	3
10-801-198	Speech	3
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

## 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 of JFETs, MOSFETs, SCRs, Shockley Diodes, Diacs, Triacs, GTOs, IGBTs, SBSs, UJT, and PUTs.

**10-605-158 POWER ELECTRONICS 2: CIRCUITS** ...application of FETs, MOSFETs, SCRs and Triacs to power circuits, triggering circuits for power control circuitry, power control and drive circuits. (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. (Prerequisite: 10-620-111, Electromechanical Fundamentals 2)

**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)

**10-620-110 ELECTROMECHANICAL FUNDAMENTALS 1** ...fundamentals of mechanics and mechanical systems including linear motion, linear forces, torque, and equilibrium leading to an understanding of work, energy, and power in mechanical systems. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry)

**10-620-111 ELECTROMECHANICAL FUNDAMENTALS 2** ...mechanics and mechanical systems by investigating momentum, rotational motion, work, energy, and power in mechanical systems culminating in an understanding of simple machines. (Corequisite: 10-620-110, Electromechanical Fundamentals 1)

**10-620-121 MECHANICS 1: BASIC** ...mechanical drive system components related to V-belt drives, chain drives, and gear drives.

**10-620-159 POWER ELECTRONICS 3: DRIVES** ...power circuitry of AC and DC drives and application of an industrial DC and AC drives to DC and AC motors. (Prerequisite: 10-660-112, Basic Electronics 3: Op-Amps; Corequisites: 10-620-161, Power Electricity 1: Motors)

**10-620-161 POWER ELECTRICITY 1: MOTORS** ...causes and results of magnetism and magnetic fields, laws of magnetic/electric interactions, DC machine and dynamo configuration, Shunt, S.E. Shunt, and PM DC machine 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)

**10-660-105 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. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry; Corequisite: 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. (Prerequisites: 10-660-105, DC 2-Circuits and 10-804-131, Algebra-Intermediate)

**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. (Corequisite: 10-660-108, AC 2: Reactance)

**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. (Prerequisite: 10-664-101, Automation 2: Motor Control; 10-660-101, Digital 1: Logic)

**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.

**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.

**10-664-150 AUTOMATION 7:PLC** ...timers, counters, and math instruction applications, creation of a flowchart detailing program structure via written specification, and modification of existing PLC program to enhance operation utilizing advanced programming functions.

**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.

**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.

**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.

**10-664-154 AUTOMATION 11:NETWORK** ...available industrial networking protocols, capabilities of various industrial networks, use of an industrial network to synchronize machines, control inputs/outputs and motion.

**10-664-155 AUTOMATION 12:ADVANCED** ...advanced human-machine interface software, programmable logic control, industrial networking, standard drive, or servo motion control programming and application.

**10-664-160 CONTROL 1:TRANSDUCERS** ...applications and utilization of motion feedback devices, force measurement devices, temperature sensors, and fluid measurement devices. (Prerequisites: 10-660-109, AC 3: RLC Circuits; 10-660-112, Basic Electronics 3: Op-Amps; 10-664-105, Automation 6: PLC)

**10-664-161 CONTROL 2: FUNDAMENTALS** ...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: Transducers; 10-664-150, Automation 7: PLC)

**10-664-162 CONTROL 3:SERVO SYSTEMS** ...hydraulic and pneumatic proportional/servo valves, servo motors, configuration and programming of an analog motion control system.

**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.

**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.

**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.

**10-664-179 MANUFACTURING SYSTEMS** ...material handling and identification technologies, types of manufacturing systems, the operation of different types of assembly lines, manufacturing cells, group technology and cellular manufacturing, definition of flexible manufacturing systems. (Prerequisites: Completion of 3rd semester coursework; 10-620-101, Fluids 2: Basic Hydraulics; 10-620-121, Mechanics 1: Basic)

**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; 10-620-121, Mechanics 1: Basic)

# Medical Assistant Program Code 315091

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC

### 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 ECGs 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.

Graduates of the Medical Assistant program will be able to:

- Obtain employment as a Medical Assistant.
- Display professionalism.
- Communicate effectively as a clinician.
- Perform clinical duties.
- Apply legal concepts to practice.
- Perform operational functions.
- Provide instruction.
- Write National Medical Assistant Certification Examinations.

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 uniforms, pay for liability insurance for the medical affiliation course, and provide their own transportation to the medical offices.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- A high school diploma or equivalent
- Satisfactory placement in the NWTC mathematics and reading tests or satisfactory placement on the ACT assessment test
- Typing proficiency of 30-words per minute
- An interview or orientation
- A satisfactory medical examination within three months before entering the program or beginning medical affiliation.
- All students are required to complete an American Heart Association Health Care Provider CPR course prior to program entry.
- All students are required to complete an American Heart Association Emergency First Aid course prior to program entry.

Medical Assistants function as members of the health care delivery team and perform administrative and clinical procedures. Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

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. (reference, AAMA)

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Certified Medical Assistant, Medical Insurance Clerk, EKG Technician, Medical Laboratory Assistant, Medical Records Clerk, Medical Office Assistant, Phlebotomist, and Receptionist.

**CERTIFIED 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.

**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

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### CURRICULUM

The Medical Assistant Technical Diploma is a one year, two-semester, plus three-week program. Upon graduation, a student will have completed 32 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-111	Micro: Windows Intro	1
* 10-501-101	Medical Terminology	3
* 31-509-301	MA Administrative Procedures	1
* 31-509-302	Human Body in Health/Disease	3
* 31-509-303	MA Laboratory Procedures 1	2
* 31-509-304	MA Clinical Procedures 1	4
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-809-199	Psychology-Human Rel	3
* 31-509-305	MA Laboratory Procedures 2	2
* 31-509-306	MA Clinical Procedures 2	3
* 31-509-307	Medical Office Insur/Finance	2
* 31-509-308	Pharmacology-Allied Health	2
* 31-509-309	Med Law Ethics/Professionalism	1
* 31-509-310	Medical Assistant Externship	3
<b>SEMESTER TOTAL</b>		<b>16</b>

\* **NOTE:** 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.

The NWTC Medical Assistant Program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP), on recommendation of the Curriculum Review Board of the American Association of Medical Assistants' Endowment (AAMAE).

Upon graduation, a student will be eligible to take the national examination for Certified Medical Assistants.

This program is fully eligible for financial aid.

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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.

**10-501-101 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.

**31-509-301 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** ...introduces students to health insurance and finance in the medical office. Students perform bookkeeping procedures, apply managed care guidelines, and complete insurance claim forms. Students use medical coding and managed care terminology to perform insurance-related duties. (Prerequisites: 31-509-301, Medical Assistant Admin Proc; 10-501-101, Medical Terminology)

**31-509-308 PHARMACOLOGY-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. (Prerequisite: 31-509-304, Medical Assistant Clinical Procedure 1)

**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. Prerequisite: 31-509-304, Medical Assistant Clinical Procedures 1)

**31-509-310 MEDICAL ASSISTANT EXTERNSHIP** ...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)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Medication Assistant

Program Code 305105

ADVANCED EDUCATION FOR QUALIFIED, CERTIFIED NURSING ASSISTANTS EMPLOYED IN NURSING HOMES

**TECHNICAL DIPLOMA - 100 HOURS, 3 CREDITS** *Classes held during the fall and spring terms based on applicant interest and eligibility.*

Offered throughout the District. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

## PROGRAM DESCRIPTION

The Certified Medication Assistant is a Certified Nursing Assistant employed in a nursing home who administers specific medications under the supervision of the nursing staff.

Graduates of the Medication Assistant program will be able to:

- Maintain employment as a Certified Medication Assistant in a nursing home.
- Define the legal and ethical responsibilities associated with the role of medication assistant.
- Identify factors that influence the effects of medications on individuals.
- Utilize guidelines common to administration of all medications.
- Utilize knowledge of systems of measurement when administering medications.
- Administer medications safely and efficiently by selected routes.
- Identify effects of common medications on each body system.
- Describe the effect of normal aging on pharmacokinetics.

## REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- At least 18 years of age
- High school diploma or HSED
- Be on State of Wisconsin Nurse Aide Directory, with current Federal eligibility
- Have at least 2000 hours experience in direct patient care within the last three years
- Have worked a minimum of 40 hours, within the last 90 days, with the residents to whom the student will be administering medications
- Be employed as a CNA with a recommendation in writing by the director of nursing and the administrator of the agency in which the student will be working during the clinical experience
- Be recommended in writing by two licensed charge nurses, one of whom must be a registered nurse

## MATH LEVEL

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 this program will have the potential for employment in a Nursing Home as a Certified Medication Assistant.

## CERTIFIED MEDICATION ASSISTANT:

administers selected medications under the supervision of the nursing staff.

## CURRICULUM

The Medication Assistant Technical Diploma is a 100-hour program. Upon graduation, a student will have completed three credits.

## FIRST SEMESTER

Course No.	Description	Credits
30-510-301	Certified Medication Assistant	3
<b>SEMESTER TOTAL</b>		<b>3</b>

This program is not eligible for financial aid.

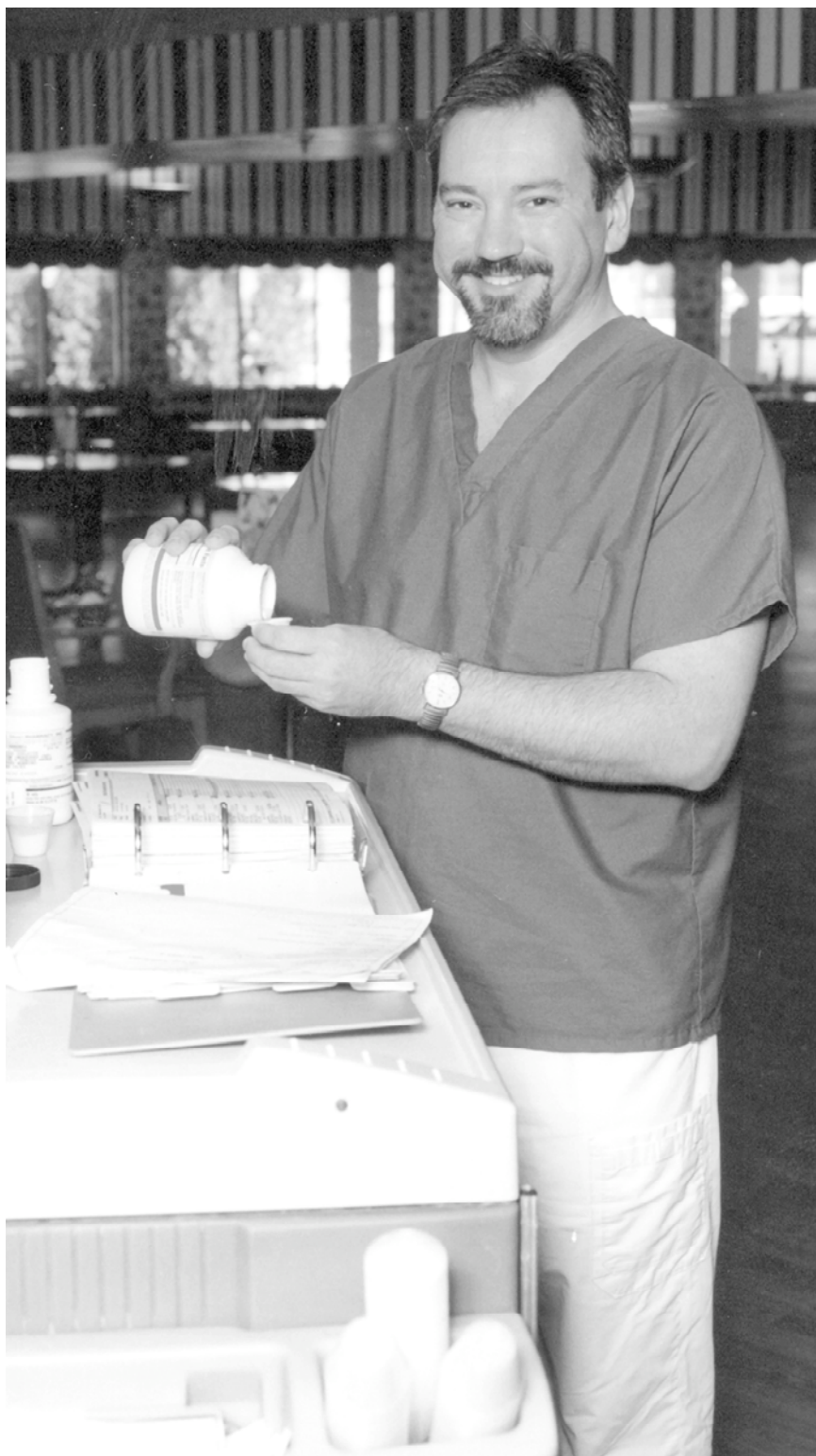
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## **COURSE DESCRIPTIONS**

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

### **30-510-301 CERTIFIED MEDICATION ASSISTANT**

...knowledge of standard practices related to administration of medications affecting multiple body systems.



Descriptions of courses not found on this page can be found in the back of the catalog.

# Microcomputer Application Software Technician (CIS)

## TECHNICAL DIPLOMA - ONE YEAR

Program Code 311075

Offered at the Marinette and Sturgeon Bay campuses. Information in Marinette: (715) 735-9361. Information in Sturgeon Bay: (920) 743-2207.

Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Microcomputer Applications Software Technician emphasizes problem solving using microcomputer hardware and software facilities including DOS and Windows operating systems, Microsoft Word, and Microsoft Excel.

Graduates of this program will be able to:

- 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 DOS commands and batch files.
- Administer and manage microcomputer operations using Microsoft Windows 2000 Professional.
- Automate common Windows operations using the Windows Script Host control language.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- One year of high school algebra or equivalent
- Ability to use computer keyboard and mouse

### MATH LEVEL

Students should have mastered basic math and algebra skills. For a description of basic math, see the Basic Education section of this catalog.

This can also be the first year of the two-year Microcomputer-Specialist (CIS) program on the Green Bay campus.

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Microcomputer Consultant, or Microcomputer Sales Representative.

**MICROCOMPUTER CONSULTANT:** provides one-on-one problem solving for users.

### MICROCOMPUTER 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.**

- Microcomputer Trainer
- Network Assistant

### CURRICULUM

The Microcomputer Applications Software Technician Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 34 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-101-102	Accounting-Intro	3
10-107-160	Micro Software-Intro	3
10-107-162	Micro Hardware/Trblesht-Intro	4
10-801-195	Communication-Written	3
10-804-151	Math-Data Proc Logic	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-102-158	Business-Intro	3
10-107-171	Micro Software Integrat/Auto	3
10-107-182	Micro Operating Systems	4
10-107-194	Micro Documentation	2
10-801-197	Reporting-Technical	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>18</b>

This program is fully eligible for financial aid.

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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.

### **10-101-102 ACCOUNTING-INTRODUCTION**

...what accounting information is, why it is important, and how it is used by economic decision-makers.

### **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.

### **10-107-160 MICRO SOFTWARE-INTRODUCTION**

...mouse techniques, file/program management using Windows, formatting documents using Word to include tables/mail merge, creating slide shows using PowerPoint to include graphics/animation, and generating spreadsheets using Excel to include charts/macros.

### **10-107-162 MICRO HARDWARE/ TROUBLESHOOTING-INTRODUCTION**

...computer terminology, component identification, POST, maintenance procedures, system boards, memory, binary and hexadecimal number systems, disk drives, FAT, operating systems, installations and configurations, internet research, troubleshooting and networking. Includes DOS exposure.

**10-107-171 MICRO SOFTWARE INTEGRATION/  
AUTOMATION** ...coverage of the integration of Microsoft Office applications. This will include DDE, OLE, fundamental programming constructs, the Office Object Model, and VBA. VBA constructions will be used to automate OLE. (Prerequisite: 10-107-160, Micro Software Intro)

### **10-107-182 MICRO OPERATING SYSTEMS**

...configuration of single machine microcomputer systems including advanced DOS batch programs, Windows Script Host scripts and Windows 2000 Professional. (Prerequisite: 10-107-162, Micro Hardware & Troubleshooting Intro)

### **10-107-194 MICRO 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)

### **10-804-151 MATH-DATA PROCESSING LOGIC**

...algorithms, percent applications, interest applications, inventory, depreciation, payroll, hexadecimal arithmetic, flow diagrams, sets, logic, and decision tables.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Microcomputer Specialist (CIS)

Program Code 101073

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay and Marinette campuses. Information in Green Bay: (920) 498-5444. Information in Marinette: (715) 735-9361.

The first year of the program is also offered on the Sturgeon Bay campus: (920) 746-4900. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Microcomputer Specialist emphasizes problem solving using current software packages, programming in Visual BASIC, hardware configurations, networking, operating systems, and software system design.

A graduate of this program will be able to:

- 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 Access 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 programming techniques.
- Install, configure, and maintain computer hardware and peripherals.
- Troubleshoot and repair computer hardware problems.
- Develop computer programs to perform common business functions using the Visual BASIC programming language.
- Perform basic computer system functions and operations using DOS commands and batch files.
- Administer and manage microcomputer operations using Microsoft Windows 2000 Professional.
- Automate common Windows operations using the Windows Script Host control language.
- 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- One year of high school algebra or equivalency
- Ability to use computer keyboard and mouse

### EMPLOYMENT POTENTIAL

A graduate of the program will have the potential for employment as a Microcomputer Consultant, Help Desk/Support Specialist, Microcomputer Programmer, Microcomputer Sales Representative, Microcomputer Trainer, or Network Assistant.

**MICROCOMPUTER 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.

**MICROCOMPUTER PROGRAMMER:** performs detailed program design, coding, testing, debugging, documentation, and implementation of online or interactive systems.

### MICROCOMPUTER SALES

**REPRESENTATIVE:** makes customer calls, establishes customer contacts, identifies customer needs, and prepares proposals.

**MICROCOMPUTER TRAINER:** trains employees on software packages which enable the user to solve problems on an individual basis.

**NETWORK ASSISTANT:** helps to configure networks, install hardware and software, and train users.

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

- Network Administrator
- Database Administrator
- Internet Site Administrator
- Hardware Technician
- CIS Department Supervisor

### MATH LEVEL

Students should have mastered basic math and algebra skills. For a description of basic math, see the Basic Education section of this catalog.

### CURRICULUM

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

#### FIRST SEMESTER

Course No.	Description	Credits
10-101-102	Accounting-Intro	3
10-107-160	Micro Software-Intro	3
10-107-162	Micro Hardware/Trblesht-Intro	4
10-801-195	Communication-Written	3
10-804-151	Math-Data Proc Logic	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-102-158	Business-Intro	3
10-107-171	Micro Software Integrat/Auto	3
10-107-182	Micro Operating Systems	4
10-107-194	Micro Documentation	2
10-801-197	Reporting-Technical	3
10-809-197	Society-Amer Contemp	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### THIRD SEMESTER

10-107-158	Micro Troubleshooting-Advanced	3
10-107-172	Micro Program-Visual Basic	4
10-107-181	Micro Database Development	4
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

10-107-190	Micro Help Desk/End User Sup	2
10-107-191	Micro Software-Advanced	4
10-107-193	Micro Internship	3
10-107-195	Micro Training	2
10-809-195	Economics	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Micro Programming in "C" (10-107-173), Network: UNIX/LINUX-Intro (10-107-157), Network: Structures 1 (10-107-163), Network: Operating Systems (10-107-164), Project/Change Management 1-MS Project (10-107-151), Project/Change Management 2-Project Manager (10-107-152), Project/Change Management 3-Case Studies (10-107-153), Computer: Java-Intro (10-107-101), Computer: Visual Basic-Advanced (10-107-175)

**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 Introduction to Accounting (10-101-102). To discuss this further, please contact an NWTC counselor.

This program is fully eligible for financial aid.

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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.

**10-107-158 MICRO TROUBLESHOOTING-ADVANCED** ...advanced microcomputer hardware and software maintenance, troubleshooting, diagnosis, and repair. (Prerequisites: 10-107-162, Microcomputer Hardware & Troubleshooting Intro; 10-107-182, Micro Operating Systems)

**10-107-160 MICRO SOFTWARE-INTRODUCTION** ...mouse techniques, file/program management using Windows, formatting documents using Word to include tables/mail merge, creating slide shows using PowerPoint to include graphics/animation, and generating spreadsheets using Excel to include charts/macros.

**10-107-162 MICRO HARDWARE/TROUBLESHOOTING-INTRODUCTION** ...computer terminology, component identification, POST, maintenance procedures, system boards, memory, binary and hexadecimal number systems, disk drives, FAT, operating systems, installations and configurations, internet research, troubleshooting and networking. Includes DOS exposure.

**10-107-171 MICRO SOFTWARE INTEGRATION/AUTOMATION** ...coverage of the integration of Microsoft Office applications. This will include DDE, OLE, fundamental programming constructs, the Office Object Model, and VBA. VBA constructions will be used to automate OLE. (Prerequisite: 10-107-160, Micro Software Intro)

**10-107-172 MICRO PROGRAMMING-VISUAL BASIC** ...program definition and design, form design, coding, testing, debugging, interactive programs, sequential and random access files, and an introduction to data structures. (Prerequisite: 10-107-171, Micro Software Integration & Automation)

**10-107-181 MICRO DATABASE DEVELOPMENT** ...database management and application development including design, automation, and use of relational database management systems using Microsoft Access. (Prerequisite: 10-107-171, Micro Software Integration & Automation)

**10-107-182 MICRO OPERATING SYSTEMS** ...configuration of single machine microcomputer systems including advanced DOS batch programs, Windows Script Host scripts and Windows 2000 Professional. (Prerequisite: 10-107-162, Micro Hardware & Troubleshooting Intro)

**10-107-190 MICRO HELP DESK/END USER SUPPORT** ...learners will become familiar with common help desk technology, tools and techniques, and gain hands-on experience. (Prerequisites: 10-107-194, Micro Documentation and 10-107-182, Microcomputer Operating Systems)

**10-107-191 MICRO SOFTWARE-ADVANCED** ...exploration, evaluation, and comparison of specialized software packages: advanced word processing with Microsoft Word, HTML coding, Java Script programming, and Java. (Prerequisites: 10-107-172, Micro Programming-Visual Basic)

**10-107-193 MICRO INTERNSHIP** ...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.

**10-107-195 MICRO TRAINING** ...students learn 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Model Building Design & Construction

Program Code 106142

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Model Building Design & Construction prepares students to build a variety of three dimensional models, such as architectural, mechanical, product development, prototype, legal, props, and special effects.

Graduates of the Model Building Design & Construction Program will be able to:

- Develop planning strategies necessary to translate two-dimensional information into a 3D model.
- 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.
- Apply a variety of industrial finishes on various materials.
- Use critical thinking and problem solving techniques in the construction of a model.
- Effectively estimate the time and cost of a model.
- Create a variety of computer aided drawings using AutoCAD, Solidworks, and Mechanical Desktop.
- Manage computer files and utilize a variety of technically related software.
- Create jigs and fixtures necessary for special machining operations.
- Work efficiently as a part of a team, or independently.
- Safely operate all hand and stationary tools typically used in a professional model shop.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)
- High school background in mathematics and science
- High school algebra or equivalent

### MATH LEVEL

Students should have an understanding of basic algebra before entering this program. 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 as an entry level Model Builder in the following areas: Architectural, Prototype, Engineering Design, Legal, Props and Special Effects, and Pattern and Mold Making.

#### 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.

**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 model will look like the finished product before production begins.

**ENGINEERING DESIGN:** translates engineering data and vendor information into scale models or CAD models for use with Rapid Prototyping Processes. Usually employed in design and development of new products or systems.

**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.**

- Architectural Design Model Builder
- Mechanical Prototype Designer
- Computer Numerical Control Machinery Programmer/Operator
- Rapid Prototyping Operator
- Free-Lance Model Builder
- Model Shop Supervisor

### CURRICULUM

The Model Building Design and Construction Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-420-151	Machine Tool-Modelmakers 1	3
10-606-112	Engineering Applications	1
10-606-113	CAD	2
10-606-119	Sketching-Technical	2
10-614-114	Model Building-Intro	4
10-801-196	Oral/Interpersonal Comm	3
10-804-130	Math-Algebra/Trigonometry	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-420-161	Machine Tool-Modelmakers 2	3
10-614-122	Model Layout/Design	3
10-614-124	Design Visualization	5
10-804-131	Math-Algebra/Inter	3
10-809-197	Society-Amer Contemp	3
<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
10-801-195	Communication-Written Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

10-614-144	Model Applications-Adv OR	4
10-614-145	Model Building Internship	4
10-801-197	Reporting-Technical	3
10-806-150	Physics 1-Technical	3
10-809-199	Psychology-Human Rel Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SUGGESTED ELECTIVES:

Machine Models (10-614-172), Model Finishing (10-614-176), Internship (10-614-195).

This program is fully eligible for financial aid.

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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.

### **10-420-151 MACHINE TOOL-MODELMAKERS 1**

...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.

### **10-420-161 MACHINE TOOL-MODELMAKERS 2**

...advanced machining and layout skills using a variety of metals utilizing vertical, horizontal, and CNC milling machines, metal lathes, and surface grinders, as well as sheet metal layout and welding basics. (Prerequisite: 10-420-151, Machine Tool-Model Makers 1)

### **10-606-112 ENGINEERING APPLICATIONS**

...basics of a computer system, computer terminology, Windows XP, Microsoft Word, Microsoft Excel, and AutoCAD.

### **10-606-113 CAD (COMPUTER AIDED DRAFTING)**

...computer aided drafting using AutoCAD software focusing on template settings; creating and manipulating layers; basic drawing, editing, and inquiry commands; blocks and attributes; and plotting. (Corequisites: 10-606-119, Sketching-Technical; Prerequisite: Familiarity with Windows file management)

### **10-614-114 MODEL BUILDING-INTRODUCTION**

...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.

### **10-614-122 MODEL LAYOUT/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. (Prerequisite: 10-606-113, Computer Aided Drafting; 10-614-114, Model Bldg Intro; 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: 10-614-114, Model Building-Intro; 10-606-113, CAD; Corequisite: 10-614-122, Model Layout/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: 10-614-114, Model Building-Intro)

### **10-614-136 MODELING 3D-CAD**

...solid modeling (3D drawing) using AutoCAD, Solid works, and Mechanical Desktop; 3D wireframe, 3D surface, and 3D solid models/drawings; rapid prototyping; importing and exporting of data. (Prerequisite: 10-606-113, Computer Aided Drafting)

### **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, Model Layout/Design; 10-614-124, Design Visualization)

### **10-614-144 MODEL APPLICATIONS-ADVANCED**

...safe use of hand and power tools; plastics; materials and techniques; patterns, mold making, and flexible molds; limited run parts; training models; product/prototype model; rapid prototyping.

### **10-614-145 MODEL BUILDING INTERNSHIP**

...cooperative agreement with a professional model making facility in which the student is paid to work for the company while learning on the job to be a professional model maker. (Instructor Approval Needed to enroll)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Native American Gaming-Casino Management

## ASSOCIATE DEGREE - TWO YEARS

Program Code 101097

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

***This program is available to anyone who is interested in a career in the gaming-casino industry.***

### PROGRAM DESCRIPTION

The Native American Gaming-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.

All graduates of this program will be able to:

- 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.

Graduates selecting the **CUSTOMER RELATIONSHIP MANAGEMENT** cluster will be able to:

- Identify, analyze and resolve customer service problems.
- Develop and implement communication to current and potential customers.
- Apply marketing concepts, service standards, and customer relationship management to the gaming industry.

Graduates selecting the **ADVANCED LEADERSHIP** cluster will be able to:

- Apply leadership and creative problem solving skills in a team environment.
- Use a total quality continuous improvement approach to organization and individual development.
- Enhance personal development regarding time and stress management in an assertive manner.

Graduates selecting the **GAMING PROTECTION** cluster will be able to:

- Qualify for advanced level positions in Gaming Protection (Security and Observation).
- Demonstrate knowledge of Gaming Operations.
- Demonstrate professional leadership skills under a stressful environment.

Graduates selecting the **SLOT TECHNICIAN** cluster will be able to:

- Identify, describe, and safely repair mechanical and electronic faults in reel and video slot machines and their component parts and assemblies.
- Understand and safely apply knowledge of electricity and electronics to reel-type and video slot machines and other similar electronic equipment.
- Read and interpret technical specifications, detail and assembly drawings, schematics, and diagrams of machine operation.

### REQUIREMENT FOR PROGRAM ENTRY:

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- Good writing and communication skills
- Strong organizational skills

### MATH LEVEL

Students should have mastered basic math skills.

For a description of basic math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

Program graduates may work in a variety of areas and levels within a gaming/casino organization depending upon their selection of course clusters. A graduate of the program will have the potential for employment as a Casino Operations Specialist, Marketing/Customer Service/Guest Relations Specialist, Slot Technician, Gaming Security Officer, Mid-Level Gaming Operation Management and Gaming Surveillance Operator.

**CASINO OPERATIONS SPECIALIST:** Responsible for providing leadership and overseeing daily operations in a casino gaming operation environment.

**MARKETING/CUSTOMER SERVICE/GUEST RELATIONS SPECIALIST:** Acts as an internal contact for customer inquiries/relationships, as well as a liaison to gaming operations.

**SLOT TECHNICIAN:** Troubleshoot and board level repair of reel-type and video slot machines and related components including power supplies, coin comparators, bill acceptors, coin hoppers, touch screens, card readers and monitors.

**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.

**CURRICULUM**

The Native American Gaming-Casino Management Associate Degree is a flexible degree program consisting of a common curriculum of general education and occupational support courses. The learner is required to select one cluster of occupational specific 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 COMPLETE:**

Course No.	Description	Credits
10-102-105	Native Amer Gaming/Reg History	3
10-102-106	Native American Gaming-Fed Reg	3
10-102-107	Native American Gaming-Policies	3
10-102-158	Business-Intro	3
	OR	
10-102-182	Business Operations	(3)
10-106-153	Professional Profile	3
10-196-191	Supervision	3
10-196-193	Human Resource Mgmt	3
10-801-195	Communication-Written	3
10-801-196	Oral/Interpersonal Communications	3
	OR	
10-801-198	Speech	(3)
10-804-101	Math-Business	3
	OR	
10-804-149	Math Processes	(3)
	OR	
10-804-130	**Math-Algebra/Trigonometry	(3)
	(**Required for the Slot Technician Cluster)	
10-809-165	Ethics in America	3
10-809-195	Economics	3
10-809-198	Psychology-Intro	3
	OR	
10-809-199	Psychology-Human Rel	(3)
10-809-197	Society-Amer Contemp	3
	OR	
10-809-170	Global Cultures	(3)
	Elective	3
	Elective	3
	<b>TOTAL CREDITS</b>	<b>48</b>

**STUDENTS SELECT ONE OF THE FOLLOWING CLUSTERS:**

**CUSTOMER RELATIONSHIP MANAGEMENT**

10-104-101	Selling Principles	3
10-104-107	Marketing Comm-Integrated	3
10-104-110	Marketing Principles	3
10-104-125	Sports/Entertainment Promotion	3
10-104-176	Consumer Behavior-Mktg	3
10-104-191	Customer Service Mgmt	3
	<b>TOTAL CREDITS</b>	<b>18</b>

**CURRICULUM (Continued)**

**ADVANCED LEADERSHIP:**

10-196-134	Legal Issues-Supervisors	3
10-196-164	Supervisors-Personal Skills	3
10-196-189	Team Building/Prob Solve	3
10-196-190	Leadership Development	3
10-196-192	Managing-Quality	3
10-196-198	Organizational Development	3
	<b>TOTAL CREDITS</b>	<b>18</b>

**GAMING PROTECTION**

10-504-124	Gaming Protection	3
10-504-125	Basic Room Operations	3
10-504-126	Basic Games Operations	3
10-504-131	Professional Communication	3
10-504-142	Constitutional Law	3
10-504-118	Protective Services-Technical Reporting	3
	<b>TOTAL CREDITS</b>	<b>18</b>

**SLOT TECHNICIAN**

10-660-104	DC 1: Introduction	1
10-660-105	DC 2: Circuits	1
10-660-107	AC 1: Properties	1
10-660-108	AC 2: Reactance	1
10-660-109	AC 3: RLC Circuits	1
10-660-101	Digital 1: Logic	1
10-660-102	Digital 2: Sequential	1
10-660-103	Digital 3: Registers	1
10-660-113	Digital 4: ALU	1
10-660-114	Digital 5: Characteristics	1
10-660-115	Digital 6: Systems	1
10-660-110	Electronics 1: Diodes-Basic	1
10-660-111	Electronics 2: Transistor-Basic	1
10-660-112	Electronics 3: Op-Amp	1
10-605-157	Power Electronics 1: Devices	1
10-605-158	Power Electronics 2: Circuits	1
10-605-187	Slot Technician Introduction	1
10-605-188	Slot Technician Advanced	1
	<b>TOTAL CREDITS</b>	<b>18</b>

**SUGGESTED ELECTIVES:**

Casino Operations-Internship (10-109-192) or Casino Operations-Field Study (10-109-193), Project Management (10-196-188) or Safety-Workplace (10-196-136), \*\*Intermediate Algebra (10-804-131) (\*\*Required elective in the Slot Technician cluster.)

This program is fully eligible for financial aid.

**COURSE DESCRIPTIONS**

These courses provide the opportunity for the student to develop the knowledge, skills, and understanding of:

**10-102-105 NATIVE AMERICAN GAMING/REG-HISTORY** ...American/Tribal history and policy, including: sovereignty, treaties, legislation and contemporary issues.

**10-102-106 NATIVE AMERICAN GAMING-FEDERAL REGULATIONS** ...Federal government regulations, including: aspects of title XXXI, Indian Gaming Regulatory Act, NIGC Regulations, Johnson and Bank Secrecy Acts.

**10-102-107 NATIVE AMERICAN GAMING-POLICIES** ...various state and local regulatory processes, including compacts, gaming ordinances, and internal control regulations.

**10-104-191 CUSTOMER SERVICE MGMT** ...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.

**10-104-101 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 COMM-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, distribution, pricing, promotional decisions, and international marketing strategy planning.

**10-104-125 SPORTS/ENTERTAINMENT PROMOTION** ...administration/strategic management process of sports promotion, functions, research, market selection, sponsorship, distribution and retailing, pricing; entertainment promotion, technology, music/theater promotion; and legal issues.

**10-196-134 LEGAL ISSUES-SUPERVISORS** ...legal practices in both union and nonunion environments, impact of US employment laws, global economy, appeal process, legal charges, hiring and firing process, harassment issues, and privacy issues.

# Native American Gaming-Casino Management (continued)

## **10-196-164 SUPERVISORS-PERSONAL SKILLS**

...time management, stress, and related challenges to a supervisor, personal planning, valuing rights and responsibilities of others, effective communication, and assertiveness.

## **10-104-176 CONSUMER BEHAVIOR**

...motivation and personality, information processing, life styles, group influences, post-purchase behavior, and other behaviors related to marketing.

## **10-196-189 TEAM BUILDING/PROB SOLVE**

...benefits and challenges of group work, necessary roles in a team, stages of team development, 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, mission and goals, ethical behavior, leadership style and adaptation, impacts of power, employee development, coaching, managing change, and conflict resolution.

## **10-196-192 MANAGING-QUALITY**

...personal philosophy of quality, identifying all stakeholder relationships, meeting/exceeding customer expectations, managing a quality improvement project, and measuring effectiveness of continuous improvement activities.

## **10-196-198 ORGANIZATIONAL DEVELOPMENT**

...issues related to how people work and exist within an organizational setting.

**10-504-124 GAMING PROTECTION** ...basic gaming sheets, slots and table games, observe suspicious activity and breaches of policy and procedure.

**10-504-125 BASIC ROOM OPERATIONS** ...basic understanding of camera systems and operations, policy and procedures for the various geographical areas of the casino and observation techniques.

**10-504-126 BASIC GAMES OPERATIONS** ...basic understanding of rules and regulations for roulette, slots, blackjack and Caribbean stud games and understanding the various personnel roles, duties and their functions.

## **10-504-131 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.

**10-504-142 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.

**10-605-157 POWER ELECTRONICS 1: DEVICES** ...the device characteristics of JFETs, MOSFETs, SCRs, Shockley Diodes, Diacs, Triacs, GTOs, IGBTs, SBSs, UJT, and PUTs.

**10-605-158 POWER ELECTRONICS 2: CIRCUITS** ...application of FETs, MOSFETs, SCRs and Triacs to power circuits, triggering circuits for power control circuitry, power control and drive circuits.

**10-605-187 SLOT TECHNICIAN INTRODUCTION** ...safety, electronic terminology/symbols and identification of electronic components. Use of test equipment and schematics to troubleshoot reel-type and video slot machines or related components.

**10-605-188 SLOT TECHNICIAN ADVANCED** ... monitor repair (chassis and board replacement), soldering unsoldering, advanced troubleshooting techniques, parts replacement, diagnosing machine-related network problems, changing boards and working with EPROMS.

**10-660-104 DC 1: INTRODUCTION** ...introduction to the concepts of DC electricity and simple series circuits. Voltage, current, resistance, Ohms Law, power, and Kirchoff's Voltage Law are defined. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry)

**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. (Prerequisite: 10-804-130, Math-Algebra/Trigonometry, Corequisite: 10-660-104, DC 1: Introduction)

**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. (Prerequisites: 10-660-205, DC 2: Circuits and 10-804-131, Algebra-Intermediate)

**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. (Corequisite: 10-660-108, AC 2: Reactance)

**10-660-101 DIGITAL 1: LOGIC** ...AND, OR, NOT, NAND, NOR, logic operations 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. (Corequisite: 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. (Corequisite: 10-660-102, Digital 2: Sequential)

**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. (Corequisite: 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. (Corequisite: 10-660-114, Digital 5: Characteristics)

**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: 10-660-106, DC 3: Circuit Theorems; Corequisite: 10-660-107, AC 1: Properties)

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**10-660-111 ELECTRONICS 2: TRANSISTOR**

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

**10-660-112 ELECTRONIC 3: OP-AMP-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. (Corequisite: 10-660-111, Electronics 2: Transistor-Basic)

**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: 10-801-195, Communication-Written)

Descriptions of general Occupational Support courses can be found after the program descriptions at the back of the catalog.

# Network Specialist (CIS) Program Code 101078

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Network Specialist teaches students to design, install, configure, and maintain computer networks.

Graduates of this program will be able to:

- 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.
- 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.
- Create effective user environments using Microsoft, Novell, and UNIX/LINUX operating systems.
- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- 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)

### MATH LEVEL

Students should have mastered basic algebra skills. 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 as a Network Support Specialist and Network Administrator.

**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

### CURRICULUM

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

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-106-145	Keyboarding	1
10-107-163	Network: Structures 1	3
10-107-164	Network: Operating Systems	2
10-801-195	Communication-Written	3
10-804-151	Math-Data Proc Logic	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND SEMESTER

10-102-158	Business-Intro	3
10-103-141	Micro: Access-Intro	1
10-107-157	Network: UNIX/LINUX-Intro	3
10-107-162	Micro Hardware/Trblesht-Intro	4
10-107-165	Network: Admin-Windows/NT	3
10-107-168	Network: Structures 2	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### THIRD SEMESTER

10-107-186	Network: Admin-Inter	4
10-107-188	Network: Applications	4
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### FOURTH SEMESTER

10-107-144	Information Tech-Emerging	2
10-107-194	Micro Documentation	2
10-107-196	Network: Admin-Adv	4
10-107-198	Network: Internship	3
10-801-198	Speech	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Network Management & Troubleshooting (10-107-150), Network: Security Fundamentals (10-107-145), Network: Firewall Installation/Configuration (10-107-146), Micro Troubleshooting-Advanced (10-107-158), Network: UNIX-Intermediate (10-107-155), Network: Admin-Novell (10-107-166), Network: Incident Reporting (10-107-169), Micro Programming-Visual Basic (10-107-172), Project/Change Management 1-MS Project (10-107-151), Project/Change Management 2-Project Manager (10-107-152), Project/Change Management 3-Case Studies (10-107-153)

This program is fully eligible for financial aid.

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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.

**10-107-157 NETWORK: UNIX/LINUX-INTRODUCTION** ...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. (Prerequisite: 10-107-164, Network:Operating Systems)

**10-107-162 MICRO HARDWARE/TROUBLESHOOTING-INTRODUCTION** ...computer terminology, component identification, POST, maintenance procedures, system boards, memory, binary and hexadecimal number systems, disk drives, FAT, operating systems, installations and configurations, internet research, troubleshooting and networking. Includes DOS exposure.

**10-107-163 NETWORK: STRUCTURES 1** ...cable characteristics and termination, structured cabling systems, OSI reference model, IP addressing and subnetting, address resolution protocol, network architectures, basic router configuration, and routing information protocol.

**10-107-164 NETWORK: OPERATING SYSTEMS** ...basic OS functions, file systems, OS installation and configuration, configuration of I/O and storage devices, basic computer communications, standard system maintenance procedures, and batch files.

**10-107-165 NETWORK: ADMINISTRATION-WINDOWS/NT** ...an introduction to Windows NOS administration and implementation. Learner will install, configure, and administer the Network Operating System in both a member-server environment and an Active Directory environment. (Prerequisite: 10-107-164, Network:Operating Systems)

**10-107-168 NETWORK: STRUCTURES 2** ...configuring routing protocols, access control lists, broadcast and collision domains, Ethernet switches, VLANs, serial protocols, WAN services, protocol analysis, cellular communications, and Internet access alternatives. (Prerequisite: 10-107-163, Network: Structures 1)

**10-107-186 NETWORK: ADMINISTRATION-INTERMEDIATE** ...NOS installation, server performance monitoring and tuning, remote client administration, DHCP, WINS, DNS, directory service and domain management, multi-vendor networks, and remote access to networks. (Prerequisites: 10-107-165, Network: Admin-Windows/NT; 10-107-157, Network: UNIX/LINUX-Intro)

**10-107-188 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. (Prerequisites: 10-107-165, Network: Admin-Windows/NT and 10-107-157, Network: UNIX/LINUX-Intro)

**10-107-196 NETWORK: ADMINISTRATION-ADVANCED** ...intranet Web site planning, implementation of Web pages using a variety of development tools, introduction to the principles of electronic commerce. (Prerequisites: 10-107-186, Network:Administration-Intermediate; 10-107-188, Network:Applications)

**10-107-198 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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Nursing Assistant

Program Code 305431

## TECHNICAL DIPLOMA-120 HOURS, 3 CREDITS

Offered throughout the District. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Nursing Assistants assist in providing care of sick or injured patients under the supervision of the nursing and/or medical staff.

Graduates of the Nursing Assistant program will be able to:

- Apply for competency testing to be placed on the Wisconsin Nurse Aide Registry.
- Obtain employment as a Nursing Assistant or Home Health Aide.
- Display behavior which supports and promotes clients' rights.
- Perform basic nursing/personal care skills.
- Assist clients in attaining and maintaining independence.
- Interact effectively with clients experiencing dementias.
- Interact on a one-to-one-basis with clients, with sensitivity to their emotional, social, and mental health.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students.

- Be at least 17 years old
- Have a medical examination satisfactorily completed within one year before entering program

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us). Individuals with abuse records may not be eligible for employment.

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Nursing Assistant or Home Health Aide.

**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.

**HOME HEALTH AIDE:** performs basic nursing tasks under the supervision and direction of the Registered Nurse in a home health environment.

Individuals with abuse records may not be eligible for employment.

### CURRICULUM

The Nursing Assistant Technical Diploma is a 120-hour program consisting of 40 hours of lab, 40 hours of video viewing, and 40 hours of clinical in a health care facility. Upon graduation, a student will have completed three credits. Orientation will be done during the first class.

#### FIRST SEMESTER

Course No.	Description	Credits
30-543-355	Nursing Assistant-Basic	3
<b>SEMESTER TOTAL</b>		<b>3</b>

This program is not eligible for financial aid.

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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.

**30-543-355 NURSING ASSISTANT-BASIC** ...basic nursing/personal care skills, principles of communication skills, client right, and team work with other care givers under the supervision of a licensed nurse.



Descriptions of courses not found on this page can be found in the back of the catalog.

# Nursing-Associate Degree

Program Code 105431

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay, Marinette, and Sturgeon Bay campuses and Shawano center (first year). Information in Green Bay: (920) 498-5543.

Information in Marinette: (715) 735-9361. Information in Sturgeon Bay: (920) 743-2207. Information in Shawano: (715) 524-2418.

### 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.

Graduates of the Nursing-Associate Degree program will be able to:

- Adhere to professional standards of practice within legal, ethical, and regulatory frameworks of the registered nurse.
- Use effective communication skills.
- Assess health of individuals, families, and groups within the context of the community.
- Make clinical decisions to assure safe and accurate nursing care.
- Provide safe caring interventions with diverse populations.
- 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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- One year of Biology and Chemistry, passed with a "C" grade or better
- Minimum standard composite score of 18 on the ACT assessment (if math or reading is 16 or below, remediation is required) or comparable score on Accuplacer exam
- Complete an interview or orientation
- Have satisfactorily completed a medical examination within three months before beginning the program
- All students are required to complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.
- All students must successfully complete a DHFS approved Nursing Assistant course prior to submitting an application to the program.
- Prior to entering the first semester nursing courses (10-543-101, 10-543-102, 10-543-103, 10-543-104) completion of 10-806-186: Intro to Biochemistry

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us)

### EMPLOYMENT POTENTIAL

A graduate of this program who becomes a Registered Nurse has the potential for employment as a Staff Nurse or Charge Nurse in a variety of health care settings.

**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 for patients and other staff in a medical facility.

Graduates of this program are eligible to take the Wisconsin State Board Examination for licensure as a Registered Nurse (RN).

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.

The Nursing-Associate Degree program is accredited by the National League for Nursing Accrediting Commission (NLNAC), and approved by the Wisconsin State Board of Nursing.

National League for Nursing  
Accrediting Commission (NLNAC)  
61 Broadway, New York, NY 10006  
(212) 363-5555 x153, FAX (212) 812-0390

Wisconsin Board of Nursing  
Dept. of Regulation & Licensing  
1400 East Washington St.  
P.O. Box 8935, Madison, WI 53708-8935  
(608) 266-2112

### CURRICULUM

The Nursing-Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 70 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-543-101	Nursing Fundamentals	2
* 10-543-102	Nursing Skills	3
* 10-543-103	Nursing Pharmacology	2
* 10-543-104	Nursing: Intro to Clin Practice	2
10-801-195	Communication-Written	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	Nursing Clin Lifespan	2
* 10-543-108	Nursing: Intro to Clin Manag	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	Nursing Comp Health Alt 1	2
* 10-543-110	Nursing Mental Health Concepts	2
* 10-543-111	Nursing Intermediate Clin	3
* 10-543-112	Nursing Advanced Skills	1
* 10-806-197	Microbiology	4
10-809-198	Intro to Psychology	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### FOURTH SEMESTER

* 10-543-113	Nursing Comp Health Alt 2	3
* 10-543-114	Nursing Mgmt Concepts	2
* 10-543-115	Nursing Adv Clin Practice	3
* 10-543-116	Nursing Clinical Transition	2
10-809-196	Intro to Sociology	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

After completion of second semester, students are eligible to take the Wisconsin State Board Exam for licensure as a Practical Nurse.

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Nursing-Associate Degree students must fulfill this requirement.

**FLEXIBLE LEARNING OPTION:** A part-time evening/weekend track is available. This option is scheduled over a 10-semester, four-year period, including three summers. For details, please refer to the Part-time Nursing - Associate Degree brochure.

**NOTE:** 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. Licensed Practical Nurses may receive advanced standing for nursing courses in the first year of the program. Introduction to AD Nursing (10-510-111) must be taken concurrent with second-year nursing courses. Call (920) 498-5430 for information.

This program is fully eligible for financial aid.

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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.

**10-543-101 NURSING FUNDAMENTALS** ...focuses on basic nursing concepts that the beginning nurse will need to provide care to diverse patient populations. Current and historical issues impacting nursing will be explored. (Prerequisite: Accepted into Nursing 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. Includes mathematic calculations and conversions. Basic medication administration, techniques related to obtaining a health history. (Prerequisite: Accepted into Nursing Program; Corequisite: 10-806-177, Gen Anatomy & Physiology)

**10-543-103 NURSING PHARMACOLOGY** ...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 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 Program; Corequisite: 10-806-177, Gen Anatomy & Physiology)

**10-543-105 NURSING HEALTH ALTERATIONS** ...provides 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** ...will cover topics related to health promotion in the context of the family; reproductive issues, pregnancy, labor and delivery, post-partum, the newborn, and the child. (Prerequisite: Completion of 1st semester coursework; Corequisites: 10-543-107, Nursing: Clin Care Life Span; 10-806-179, Advanced Anatomy & Physiology)

**10-543-107 NURSING CLINICAL CARE ACROSS LIFESPAN** ...clinical experience applies nursing concepts and therapeutic interventions to clients across the lifespan. Provides an introduction to concepts of teaching and learning. Extending care to include the family is emphasized. (Prerequisite: Completion of 1st semester coursework; Corequisites: 10-543-105, Nursing Health Alterations; 10-806-179, Advanced Anatomy & Physiology)

**10-543-108 NURSING: INTRO TO CLINICAL MANAGEMENT** ...clinical experience applies nursing concepts and therapeutic nursing interventions to groups of clients. 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 NURSING COMPLEX HEALTH ALTERATIONS 1** ...caring for clients with alterations in musculoskeletal, 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: 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-110 NURSING MENTAL HEALTH COMMUNITY CONCEPTS** ...topics related to the delivery of community and mental health care. Needs of individualism families, and groups will be addressed. Attention will be given to diverse and at-risk populations. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-111 NURSING INTERMEDIATE CLINICAL PRACTICE** ...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. (Prerequisite: Completion of 2nd semester coursework; Corequisites: 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-112 NURSING ADVANCED SKILLS** ...focuses on the development of advanced clinical skills. 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: 10-809-198, Intro to Psychology; 10-806-197, Microbiology)

**10-543-113 NURSING COMPLEX HEALTH ALTERATIONS 2** ...topics related to clients with alterations in immune, neuro-sensory, musculoskeletal, GI, hepatobiliary, renal/urinary, and reproductive systems. Also high risk perinatal and newborns, ill child, critical, life-threatening situations. (Prerequisite: Completion of 3rd semester coursework)

**10-543-114 NURSING MANAGEMENT/ PROFESSIONAL CONCEPTS** ...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)

**10-543-115 NURSING ADVANCED CLINICAL PRACTICE** ...advanced clinical course requires the student to integrate concepts from all previous courses in the management of groups of clients facing complex health alterations. (Prerequisite: Completion of 3rd semester coursework; Corequisite: 10-543-113, Nursing Complex Health Alt 2)

**10-543-116 NURSING CLINICAL TRANSITION** ...promotes relatively independent clinical decisions, delegation, and works collaboratively with others to achieve client and organizational outcomes transitioning to the role of the graduate nurse. (Prerequisites: Completion of 3rd semester coursework; 10-543-113, Nursing Complex Health Alterations 2; 10-543-115, Nursing Advanced Clinical Practice. Corequisite: 10-543-114, Nursing Management Concepts)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Office Assistant

Program Code 311061

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay and Marinette campuses. Offered part-time at the Sturgeon Bay campus. Information in Green Bay: (920) 498-5444. Information in Marinette: (715) 735-9361. Information in Sturgeon Bay: (920) 746-4900. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Office Assistant prepares students for entry-level office positions. Skills are developed in word processing, spreadsheet, presentation graphics, machine transcription, telephone, records management, machine calculation, office procedures, and keyboarding. Credits earned in the program can be applied to the Administrative Assistant Associate Degree program.

Graduates of this program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Basic math
- A keyboarding skill of 20 wpm using the TOUCH method is recommended.

### MATH LEVEL

Students should have mastered basic math skills. For a description of math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as Office Assistant, File Clerk, Receptionist, Transcriptionist, or Data Entry/Typist.

**OFFICE ASSISTANT:** performs a variety of duties related to typing, filing, transcribing, word processing, telephoning, making appointments, recordkeeping, setting up meetings, handling customer relations, entering data, and handling incoming and outgoing mail.

**FILE CLERK:** works in offices with a great volume of records in which indexing, cross-referencing, filing, retrieving, and charging-out records are important job functions.

**RECEPTIONIST:** operates simple to complex telephone systems; handles customer relations; and assists with other office work such as filing, typing, processing mail, and scheduling.

**TRANSCRIPTIONIST:** serves as a word processor using transcribing equipment and word processing software.

**DATA ENTRY/TYPIST:** enters data and produces correspondence, reports, and documents needed by the office using word processing software.

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

- Administrative Assistant
- Executive Secretary
- Team Leader
- Office Manager

### CURRICULUM

The Office Assistant Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 35 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-111	Micro: Windows-Introduction	1
10-103-121	Micro: Word-Introduction	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
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-103-131	Micro: Excel-Introduction	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	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

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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.

### **10-103-111 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, creating charts; outlines, and web pages; and applying styles. Requires Windows experience.

### **10-103-122 MICRO: WORD-PART 2**

...advanced word processing features including merge, sort and select; text flow; footnotes/endnotes, images, shapes, and WordArt; macros; shared documents; master and subdocuments; specialized tables and indexes; forms; and sharing data. Requires strong introductory Word skills.

### **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**

...prepare overheads, handouts, and slide shows using Wizards, templates, Word Art, animations, transitions, and hyperlinks. Requires Windows experience.

### **10-103-160 MICRO: OUTLOOK**

...use email, personal distribution list, signature, attachments, and task list; schedule appointments using calendar; flag, filter, sort, and merge contacts, add voting buttons, delivery receipts, and delivery dates to messages.

### **10-106-103 INFORMATION PROCESSING**

**PRINCIPLES** ...information processing cycle and workflow, terminology, hardware, software, 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 45 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 50 wpm in a 5 minute timing. Requires touch keyboarding at 45 wpm.

### **10-106-126 ADMINISTRATIVE BUSINESS**

**PROCEDURES 1** ...today's global business environment, including time management using PIM software, flexible work arrangements, processing mail, meeting coordination, copiers and fax machines, and application of common business letters using appropriate formats. Requires Windows, intermediate Word, and PowerPoint experience.

### **10-106-131 PROOFREADING/EDITING**

**ESSENTIALS 1** ...will develop skills for identifying and correcting grammar, spelling, punctuation, capitalization, and usage errors in business documents. Use reference sources and manuals to problem-solve. Introduction to transcription equipment. (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 techniques and reference manuals. Multitasking and decision-making skills are enhanced through transcription, composition, and proofreading. (A passing grade in Proofreading/Editing Essentials 1 is a strong recommendation for success.)

### **10-106-142 SOFTWARE PROJECTS**

...applying Windows 2000 and Word 2002 features to manage and format business documents while exercising decision-making skills and enhancing keyboarding in a team setting. Requires Windows and intermediate Word background.

### **10-106-143 BUSINESS EXPERIENCE-APPLIED**

...creating a portfolio, studying job search skills, completing a job search, and participating in a field experience. Course should be taken during the last semester.

### **10-106-152 RECORDS MANAGEMENT**

...major systems of classification: alphabetic, numeric, geographic, subject, chronologic, and micro systems; 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 features, equipment, messaging, cellular technology, pagers, electronic, and voice mail.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Paralegal

Program Code 101101

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### 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.

Graduates of this program will be able to:

- 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

NWTC requires an entrance skill inventory for all program students. Please see Accuplacer section of this catalog for more information.

- Ability to use Windows and Microsoft Word proficiently
- Successful completion of reading and language assessment prior to admission

### MATH LEVEL

Students should have mastered basic math skills.

For a description of basic math, see the Basic Education section of this catalog.

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 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:

NWTC has designated the following courses as legal specialty courses:

### REQUIRED 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

### CHOICES

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

### 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

Course No.	Description	Credits
10-110-101	Paralegal Intro/Legal Ethics	3
10-801-175	English Composition 1	3
10-801-196	Oral/Interpers Communication	3
	OR	
10-801-198	Speech	3
10-804-149	Math Processes	3
10-890-101	Philosophy of Critical Thinking	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

#### SECOND SEMESTER

10-101-184	Business Finance/Budgeting	3
10-106-141	Information Process-Legal	3
10-110-102	Civil Litigation 1	3
10-110-104	Legal Research	3
10-110-110	Real Estate Law (or choice below)	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

#### THIRD SEMESTER

10-110-103	Civil Litigation 2	3
10-110-106	Law-Family (or choice below)	3
10-110-107	Legal Aspects/Business Org	3
10-110-114	Administration of Estates (or choice below)	3
10-809-199	Psychology-Human Rel	3
	OR	
10-809-198	Psychology-Intro	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	Employment Law (or choice below)	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	OR	
10-809-196	Sociology-Intro	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

#### CHOICES BELOW: Must take 4 of 7

10-101-123	Accounting-Income Tax
10-110-106	Law-Family
10-110-110	Real Estate Law
10-110-114	Administration of Estates
10-110-115	Administrative Law
10-110-122	Creditor/Debtor Relations
10-110-168	Paralegal Criminal Procedures

This program is fully eligible for financial aid.

**NOTE:** \*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).

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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.

**10-101-123 ACCOUNTING-INCOME TAX** ...the determination of individual income taxes including income, deductions, tax calculation, credits, and payments. Forms preparation is practiced along with the study of the income tax law.

**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: 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; 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: 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; 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: 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: 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: 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: 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: 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: 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. (Prerequisite: 10-110-101, Paralegal Intro/Legal Ethics)

**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)

**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: 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: 10-110-101, Paralegal Intro/Legal Ethics)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Paramedic - Emergency Medical Technician

## TECHNICAL DIPLOMA - ONE YEAR

Program Code 305312

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Paramedic-Emergency Medical Technician Program will be able to:

- 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.

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.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Be currently licensed as an EMT in the State of Wisconsin
- Have a service affiliation with a paramedic ambulance service to complete the required field experience needed to qualify for licensure
- Students not affiliated with a paramedic ambulance service may be admitted to the program. Such 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. Additional course costs would accompany this requirement.
- Students are required to maintain a current CPR card on a two-year renewal cycle to comply with affiliating agency requirements.

### MATH LEVEL

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 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.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### CURRICULUM

The Paramedic Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 24 credits.

#### FIRST SEMESTER

Course 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>

### STRONGLY RECOMMENDED COURSE

It is strongly recommended that the students who are non-affiliated with a paramedic service take this course in order to fulfill the course requirements and successfully complete the program.

Course No.	Description	Lecture Hours	Credits
30-531-326	Paramedic-Clinical 3	216	3

This program is fully eligible for financial aid.

## 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)

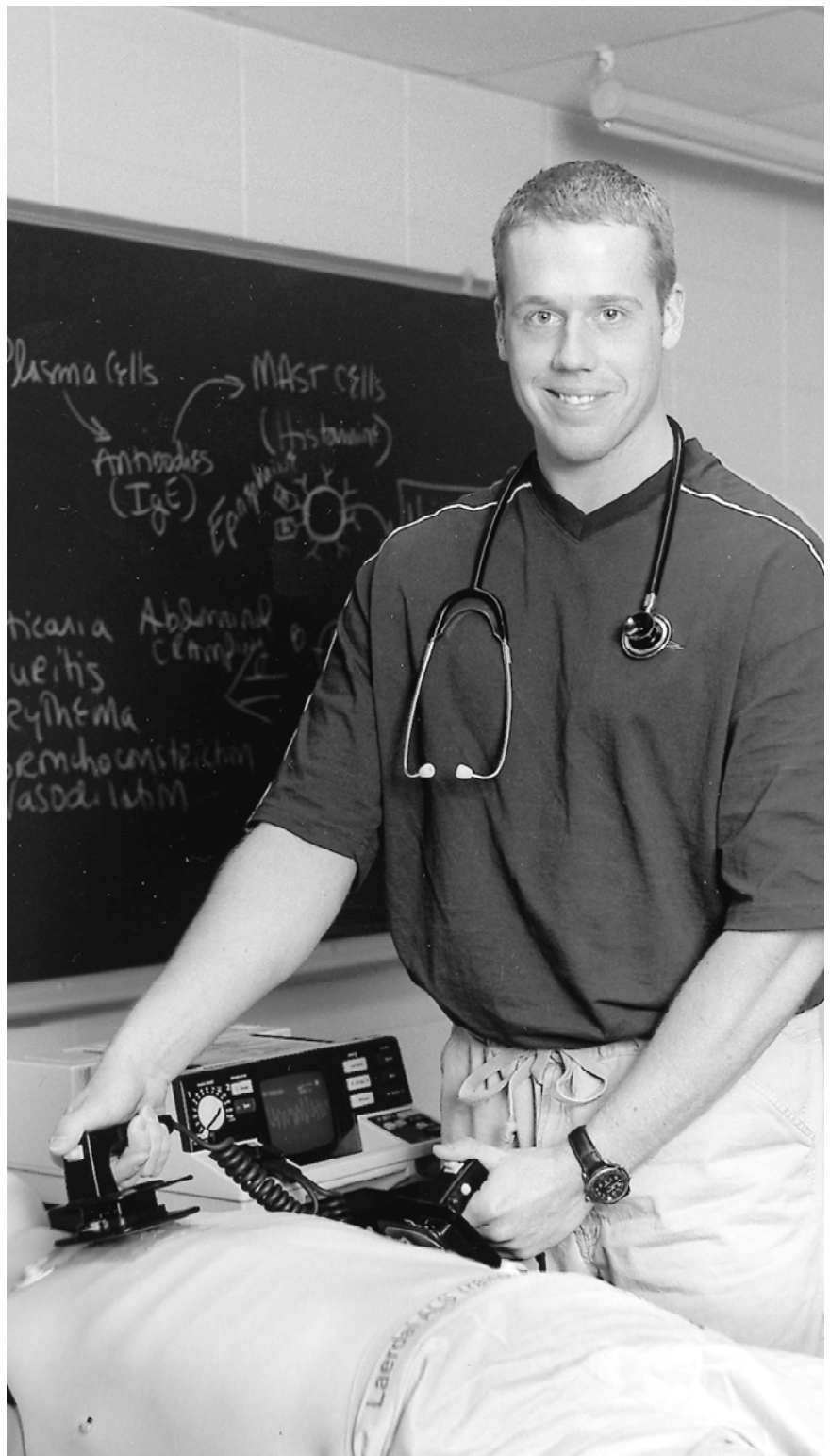
**30-531-331 PARAMEDIC PRINCIPLES 1B** ...roles and responsibilities of the paramedic, human systems and patient assessment, shock and fluid therapy, pharmacology, assessment/management of respiratory and cardiovascular emergencies.

### **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.



Descriptions of courses not found on this page can be found in the back of the catalog.

# Physical Therapist Assistant

Program Code 105241

## ASSOCIATE DEGREE - TWO YEARS PLUS ONE SUMMER

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Physical Therapist Assistant program educates students to carry out patients' rehabilitation programs under the supervision of a licensed physical therapist.

Graduates of the Physical Therapist Assistant program will be able to:

- Perform in a safe manner that minimizes risk to patient, self, and others.
- Conduct self in a responsible manner.
- Interact in a respectful manner.
- Adhere to ethical standards.
- Adhere to legal standards.
- Communicate in ways that are congruent with situational needs.
- Produce documentation to support the delivery of physical therapy services.
- Deliver established patient care to reflect respect for and sensitivity to individual differences.
- Participate in activities addressing quality of service delivery.
- Participate in patient status judgments in the clinical environment based on the plan of care established by the physical therapist.
- Perform assessments.
- Discuss the need for modifications to the plan of care established by the physical therapist.
- Perform physical therapy interventions in a technically competent manner.
- Educate others (patients, family, caregivers, staff, students, health professionals) using relevant and effective teaching methods.
- Participate in addressing patient needs for services other than physical therapy.
- Manage time and financial resources.
- Use physical therapy aides and other support personnel according to legal standards and ethical guidelines.
- Implement a self-directed plan for life-long learning.
- Assist the physical therapist in addressing primary and secondary prevention for individuals and groups.

Students will be required to purchase a nametag, provide their own transportation to clinical facilities, pay for liability insurance for each clinical course, and cover any other expenses related to their fieldwork experiences.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

All students are required to have a complete physical and to maintain current immunization information.

All students are also required to complete an American Heart Association Health Care Provider CPR course and are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.

### 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 the physical therapist.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Minimum standard composite score of 20 on the ACT assessment
- High school diploma or equivalency
- High school algebra (or attain a minimum of 80% on the NWTC algebra examination)
- One year of biology or equivalent
- One year of advanced biology, chemistry, physics, or equivalent; all with grades of C or better
- Have a medical examination satisfactorily completed within three months before entering the program
- Basic computer skills

### MATH LEVEL

Students should have mastered basic math skills and Accuplacer tests for algebra. For a description of basic math, see the Basic Education section of this catalog.

**NOTE:** A student who does not meet the above requirements should consult with an NWTC counselor about ways to make up any deficiencies through testing or course work.

The Physical Therapist Assistant Program is fully accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE/APTA)  
American Physical Therapy Association  
1111 N. Fairfax Street,  
Alexandria, VA 22314  
(703) 684-2782

### CURRICULUM

The Physical Therapist Assistant Associate Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 72 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-524-112	Physical Therapist Asst-Intro	2
* 10-524-114	Physical Therapist Asst 1	3
* 10-524-118	PTA-Pathology Concepts	2
10-801-195	Communication-Written	3
* 10-806-116	Physics-PTA	4
10-806-177	Gen Anatomy & Physiology	4
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

* 10-524-113	PTA-Measurement Test	3
* 10-524-124	Physical Therapist Asst 2	4
10-801-196	Oral/Interpersonal Comm	3
10-806-179	Adv Anatomy & Physiology	4
10-809-198	Intro to Psychology	3
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SUMMER SEMESTER

* 10-524-132	Physical Therapist Asst 3	3
* 10-524-133	Physical Therapist Assist-Peds	2
10-809-196	Intro to Sociology	3
<b>SEMESTER TOTAL</b>		<b>8</b>

#### THIRD SEMESTER

* 10-524-104	PTA 4	4
* 10-524-134	PTA-Clinical Problems 1	1
* 10-524-137	PTA Fieldwork-1A	1
* 10-524-138	PTA Fieldwork-1B	1
* 10-524-144	Physical Therapist Asst 5	4
10-809-195	Economics	3
	Elective	1
<b>SEMESTER TOTAL</b>		<b>15</b>

#### FOURTH SEMESTER

* 10-524-136	PTA-Health Care Systems	1
* 10-524-145	PTA-Clinical Problems 2	1
* 10-524-147	PTA Fieldwork-2A	3
* 10-524-148	PTA Fieldwork-2B	3
* 10-524-149	PTA-Ethical Decision Making	1
	Elective	5
<b>SEMESTER TOTAL</b>		<b>14</b>

**SUGGESTED ELECTIVES:** Sports Medicine/Athletic Training (10-524-146), and Fitness Test/Prescription (10-524-151).

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Physical Therapist Assistant students must fulfill this requirement.

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

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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.

### 10-524-104 PHYSICAL THERAPIST ASSISTANT 4

...anatomy of the CNS, neuroscience of movement, psychosocial aspects of disability, PNF/NDT rehab techniques, CNS disease pathology, movement re-education, environmental assessment, rheumatic diseases, post-amputee, and cardiopulmonary rehabilitation. (Prerequisites: 10-524-132, Physical Therapist Asst 3; 10-524-133, PTA-Pediatrics)

**10-524-112 PHYSICAL THERAPIST ASSISTANT-INTRODUCTION** ...profession, APTA, physical therapy personnel, practice settings, accreditation, rehabilitation teams, legal practice, problem oriented medical system, SOAP note writing, narrative note writing, terminology, abbreviations, and progress notes. (Prerequisite: Accepted into Physical Therapist Assistant)

### 10-524-113 PTA-MEASUREMENT/TESTING

...human anatomy, and normal functional motion techniques of goniometry, manual muscle testing, analysis of individual posture and gait patterns. (Prerequisites: 10-524-114, PTA 1; 10-524-112, PTA Intro; 10-806-116, Physics; 10-524-118, PTA Pathology Concepts; 10-806-177, Anatomy & Physiology-General; Corequisite: 10-806-179, Anatomy & Physiology Advanced)

### 10-524-114 PHYSICAL THERAPIST ASSISTANT 1

...physical therapy procedures relating to activities of daily living, patient care, assistive devices, vital signs, medical asepsis, body mechanics, correct body positioning, transfers, and basic gait patterns. (Prerequisite: Accepted into Physical Therapist Assistant program; Corequisite: 10-806-177, Anatomy & Physiology-General)

### 10-524-118 PHYSICAL THERAPIST ASSISTANT-PATHOLOGY CONCEPTS

...medical and pathological conditions commonly encountered in physical therapy, etiology, symptomatology, treatment concepts, and medical terminology. (Prerequisite: Accepted into Physical Therapist Assistant program)

### 10-524-124 PHYSICAL THERAPIST ASSISTANT 2

...theory, principles, and technical skills of modalities used in physical therapy: hydrotherapy, cryotherapy, therapeutic heat, ultrasound, ultraviolet, electrical stimulation, intermittent compression, traction, paraffin, biofeedback, and massage. (Prerequisites: 10-524-114, PTA 1; 10-524-112, PTA Intro; 10-806-116, Physics; 10-524-118, PTA Pathology Concepts; 10-806-177, Anatomy & Physiology-General; Corequisite: 10-806-179, Anatomy & Physiology Advanced)

### 10-524-132 PHYSICAL THERAPIST ASSISTANT 3

...principles and techniques of therapeutic exercise, specific pathophysiological conditions, and related therapeutic exercise programs. (Prerequisites: 10-524-124, PTA 2; 10-524-113, PTA-Measurement and Testing; 10-806-179, Adv Anatomy & Physiology)

### 10-524-133 PHYSICAL THERAPIST ASSISTANT-PEDIATRICS

...normal and abnormal human development, pediatric pathologies and dysfunctions, and physical therapy treatment approaches. (Prerequisites: 10-524-113, PTA-Measurement Test; 10-806-179, Adv Anatomy & Physiology)

### 10-524-134 PTA-CLINICAL PROBLEMS 1

...Medicare documentation, pharmacology, diversity in clinical practice, supervisory and department functions, importance of the health professional/patient relationship, writing progress notes. (Prerequisites: 10-524-132, PTA 3; 10-524-133, Pediatrics; Corequisites: 10-524-137, PTA Fieldwork 1A; 10-524-138, PTA Fieldwork 1B)

### 10-524-136 PTA-HEALTH CARE SYSTEMS

...current concepts, philosophy, and application of health care systems in the US and their relationships to the practice of physical therapy and health care financing models. (Prerequisites: 10-524-134, Clinical Problems 1; 10-524-137, PTA Fieldwork 1A; 10-524-138, PTA Fieldwork 1B; Corequisite: 10-524-149, Ethical Decision Making)

### 10-524-137 PHYSICAL THERAPIST ASSISTANT 1A-FIELDWORK

...part-time clinical experience provides an opportunity in a clinical setting to apply theoretical and technical abilities that are expected of entry-level physical therapist assistants. (Prerequisites: 10-524-132, PTA 3; 10-524-133, Pediatrics; Corequisites: 10-524-134, Clinical Problems 1; 10-524-138, PTA Fieldwork 1B)

### 10-524-138 PHYSICAL THERAPIST ASSISTANT 1B-FIELDWORK

...part-time clinical experience provides an opportunity in a clinical setting to apply theoretical and technical abilities that are expected of entry-level physical therapist assistants. (Prerequisites: 10-524-132, PTA 3; 10-524-133, Pediatrics; Corequisites: 10-524-137, PTA 1A-Fieldwork; 10-524-134, Clinical Problems 1)

### 10-524-144 PHYSICAL THERAPIST ASSISTANT 5

...assessment and treatment of orthopedic/musculoskeletal disorders, wound and burn care, and geriatric conditions; and psychosocial aspects of the aging process and terminal illness. (Prerequisite: 10-524-132, PTA 3; Corequisite: 10-524-134, Clinical Problems 1)

### 10-524-145 PTA-CLINICAL PROBLEMS 2

...discussion of fieldwork situations, interviewing and job-seeking skills, preparation and presentation of an individual case study, complete a competency based, written final examination, and submit two fieldwork journals. (Prerequisites: 10-524-134, Clinical Problems 1; 10-524-138, PTA 1B-Fieldwork; 10-524-137, PTA Fieldwork 1A; Corequisites: 10-524-147, PTA Fieldwork 2A; 10-524-148, PTA Fieldwork 2B)

### 10-524-147 PHYSICAL THERAPIST ASSISTANT FIELDWORK-2A

...theoretical and technical abilities required in the clinical settings for integration and refinement of practice as a physical therapist assistant. (Prerequisites: 10-524-138, PTA 1B-Fieldwork; 10-524-134, Clinical Problems 1; 10-524-137, PTA Fieldwork 1A. Corequisites: 10-524-145, Clinical Problems 2; 10-524-148, PTA Fieldwork 2B)

### 10-524-148 PHYSICAL THERAPIST ASSISTANT FIELDWORK-2B

...theoretical and technical abilities required in clinical settings for integration and refinement of practice as a physical therapist assistant. (Prerequisites: 10-524-134, Clinical Problems 1; 10-524-137, PTA Fieldwork 1A; 10-524-138, PTA Fieldwork 1B; Corequisites: 10-524-147, PTA 2A-Fieldwork; 10-524-145, Clinical Problems 2)

### 10-524-149 PTA-ETHICAL DECISION MAKING

...elements of ethics, prototypes of ethical problems, ethical situations encountered in physical therapy/health care, and the application of the six-step process of ethical decision making to PTA Fieldwork experiences. (Prerequisites: 10-524-134, Clinical Problems 1; 10-524-137, PTA Fieldwork 1A; 10-524-138, PTA Fieldwork 1B; Corequisite: 10-524-136, Health Care Systems)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Power Engineering and Boiler Operator

Program Code 304281

## TECHNICAL DIPLOMA - TWO YEARS, PART-TIME

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Power Engineering and Boiler Operator prepares students to manage, operate, and control low and 120 high-pressure boilers and auxiliary systems in factories, plants, and buildings.

Graduates of the Power Engineering and Boiler Operator Program will be able to:

- 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
- Study American Society of Power Engineers (ASOPE) Standards and Testing
- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

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 3rd or 4th Class Power Engineer/Boiler Operator, Boiler Service Technician, Boiler Installer, or Boiler Chemical Sales Representative.

#### 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 16 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-196-191	Supervision	3
30-428-344	Power Engineering I	3
30-403-338	Power House-Blueprint Rgd	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
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>16</b>

**NOTE:** A two-year diploma completion schedule is only possible if adequate course enrollment is attained.

This program is not eligible for financial aid.

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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.

### **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 NIULPE exams to qualify for 3rd class licensing.

**30-428-337 POWER HOUSE-ECONOMICS** ...guide student in combining newly learned principles with available reference material to determine basic powerhouse economics.

**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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Practical Nursing

Program Code 315431

## TECHNICAL DIPLOMA - TWO SEMESTERS

Offered at the Green Bay, Sturgeon Bay, and Marinette campuses. Information in Green Bay: (920) 498-5543. Information in Marinette: (715) 735-9361. Information in Sturgeon Bay: (920) 746-4900.

### 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.

Graduates of the program will be able to:

- Adhere to standards of practice within legal, ethical, and regulatory frameworks of the licensed practical nurse.
- Use effective communication skills.
- Assist with health assessment of individuals, families, and groups.
- Participate in clinical decision-making within the LPN scope of practice.
- Provide safe caring interventions with diverse populations.
- Use principles of teaching and learning processes to reinforce teaching plans.
- 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

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent.
- Students must take an Accuplacer exam and attain program benchmarks (see Accuplacer section of the catalog) before admission to the program.
- An interview/orientation.
- A medical examination form satisfactorily completed within three months before beginning the program.
- All students are required to complete an American Heart Association Health Care Provider CPR course prior to program entry.
- Students are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.
- Completion of an approved first aid course prior to program entry.
- All students must successfully complete a DHFS approved Nursing Assistant course prior to submitting an application to the program.

### MATH LEVEL

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 this program will have the potential for employment as a Licensed Practical Nurse (LPN) or a Health Insurance Claims Approver.

**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.

Graduates of the program are eligible to take the Wisconsin State Board Examination for licensure as a Licensed Practical Nurse (LPN).

Individuals with abuse records may be ineligible for employment in nursing homes.

Individuals with criminal records may be ineligible for licensure.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us)

The Practical Nursing program is accredited by:

Wisconsin Board of Nursing  
Dept. of Regulation & Licensing  
1400 East Washington St.  
P.O. Box 8935  
Madison, WI 53708-8935  
(608) 266-2112

### CURRICULUM

The Practical Nursing Technical Diploma is a two semester program. Upon graduation, a student will have completed 30 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-801-195	Communication-Written	3
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	Nursing: Intro to Clin Practice	2
* 31-806-312	Anatomy/Struct-Funct	2
<b>SEMESTER TOTAL</b>		<b>17</b>

#### SECOND 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	Nursing: Clinical Care Lifespan	2
* 31-543-308	Nursing: Intro to Clinical Mgmt	2
<b>SEMESTER TOTAL</b>		<b>13</b>

**NOTE:** A minimum of a C grade is required for all courses marked with an asterisk (31-806; 31-543).

It is suggested that a Medical Terminology course (10-501-101) be taken prior to entering the program.

It is also suggested that the NWTC Skills Center be used for developing study, test-taking, and math skills prior to entering the program.

This program is fully eligible for financial aid.

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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.

**31-543-301 NURSING FUNDAMENTALS** ...focus on basic nursing concepts that the beginning nurse will need to provide care to diverse patient populations. Current and historical issues impacting nursing will be explored. (Prerequisite: Accepted into Practical Nursing Program; Corequisite: 31-806-312, Anatomy/Structure Function)

**31-543-302 NURSING SKILLS** ...focuses on development of clinical skills and physical assessment across the lifespan. Includes mathematic calculations and conversions, basic medication administration, techniques related to obtaining a health history. (Prerequisite: Accepted into Practical Nursing Program; Corequisite: 31-806-312, Anatomy/Structure Function)

**31-543-303 NURSING PHARMACOLOGY** ...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; Corequisite: 31-806-312, Anatomy/Structure Function)

**31-543-304 NURSING: INTRODUCTION TO CLINICAL PRACTICE** ...basic nursing skills, the formation of nurse -client relationships, communication, data collection, documentation, and medication administration. (Prerequisite: Accepted into Practical Nursing Program; Corequisite: 31-806-312, Anatomy/Structure Function)

**31-543-305 NURSING HEALTH ALTERATIONS** ...provides 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** ...covers topics related to health promotion in the context of the family. Reproductive tissues, pregnancy, labor and delivery, post-partum, the newborn, and the child are included. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-307, Nursing: Clinical Care Across Lifespan)

**31-543-307 NURSING:CLINICAL CARE ACROSS THE LIFESPAN** ...clinical experience applies nursing concepts and therapeutic interventions to clients across the lifespan. 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 NURSING: INTRODUCTION TO CLINICAL MANAGEMENT** ...applies nursing concepts and therapeutic nursing interventions to groups of clients. It also provides an introduction to leadership, management, and team building. (Prerequisite: Completion of 1st semester courses; Corequisite: 31-543-305, Nursing Health Alterations)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Press Technician-Printing

Program Code 312041

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Press Technician-Printing program trains students in pre-press operations, offset presswork, lithographic and flexographic reproduction, film assembly and finishing processes, and electronic publishing.

Graduates of this program will be able to:

- Analyze jobs for operations and materials costs.
- Perform electronic pre-press operations.
- Lay out jobs and generate film for production.
- Create press proofs.
- Set up and operate offset and flexographic printing presses.
- Maintain a safe work environment.
- Create machine operation procedures.
- Pre-flight jobs for various printing processes.
- Perform finishing operations on printed jobs.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see Accuplacer section of this catalog for more information.

- Math skills
- Communication skills.

### MATH LEVEL

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 this program will have the potential for employment as Bindery/Finishing Operator, Estimator/Production Planner, Plate Mounter, Offset/ Flexographic Press Assistant, Offset/Flexographic Press Operator.

**BINDERY/FINISHING OPERATOR:** operates machines that cut, fold, collate, staple, stitch, trim, and bind pages.

**ESTIMATOR/PRODUCTION PLANNER:** prepares price quotations, estimates for printing, and preliminary production schedules.

**PLATE MOUNTER:** makes and mounts plates specific to printing processes and presses.

**OFFSET/FLEXOGRAPHIC PRESS ASSISTANT:** prepares press for run; runs press proof; adjusts plate, paper feed, tension of paper; ink and water flow.

**OFFSET/FLEXOGRAPHIC PRESS OPERATOR:** sets up, prepares and operates presses; loads paper, installs printing plates, adjusts guides and control for machine operations.

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

- Graphic Designer
- Pre-Press Technician
- Print Production Supervisor/Manager
- Estimator
- Pre-Flight Specialist

### CURRICULUM

The Press Technician-Printing Technical Diploma is a one-year, two-semester program. Upon graduation, students will have completed 31 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-111-103	Graphic Workstations	1
10-111-120	Macintosh Publishing	3
10-111-161	Macintosh Illustration	3
10-204-110	Publishing Technologies	3
10-204-111	Digital Publishing Operations	3
10-801-195	Communication-Written	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

10-111-101	Macintosh-Image Editing	3
10-111-125	Graphic Reproduction Tech	3
10-204-120	Publishing Operations-Offset	3
10-204-122	Digital Publishing Systems	3
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>15</b>

This program is fully eligible for financial aid.

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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.

### 10-111-101 MACINTOSH-IMAGE EDITING

...(Adobe Photoshop + Adobe Acrobat); scanning, editing, color correcting and creating composite montage photographs. Prepare images for publication in print or the internet. An introduction to manipulating bitmap images. (Prerequisite: 10-111-103, Graphic Workstations)

**10-111-103 GRAPHIC WORKSTATIONS** ...computer operating system, basic computer hardware, and basic computer software.

**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)

### 10-111-125 GRAPHIC REPRODUCTION

**TECHNIQUES** ...basic process of reproducing images using offset lithography including electronic imaging, preflighting, trapping concepts, imposition, and collect for output. (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)

### 10-204-110 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)

### 10-204-120 PUBLISHING OPERATIONS-OFFSET

...detailed overview of the flexographic printing and offset lithographic printing processes; learners integrate classroom press operating experiences with interactions with industry. (Prerequisite: 10-111-103, Graphic Workstations)

### 10-204-122 DIGITAL PUBLISHING SYSTEMS

...printing management process, related management skills, leadership skills, quality assessment techniques, and production schedules. (Prerequisite: 10-111-103, Graphic Workstations)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Programmer/Analyst (CIS)

Program Code 101071

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

This program prepares students for employment as business applications programmers. Programmers are responsible for writing computer programs to solve business problems.

Graduates of this program will be able to:

- Develop programs using COBOL or RPG.
- Develop programs using Visual Basic.Net.
- Develop object oriented programs using Java.
- Develop batch programs to generate business reports.
- Develop interactive programs to maintain files.
- Maintain existing programs in languages taught in the program.
- Develop a normalized database.
- Use AS400 and PC developmental tools and PC integrated development environments.
- Manage small projects.
- Develop control language programs.
- Use system development methods including System Development Life Cycle, Prototyping, and Object-Oriented Analysis and Design.
- Develop client applications in a client/server environment, including graphical user interfaces, web entry forms, and web reports.
- Develop server side applications in a client/ server environment, including database access, business rule enforcement, and stored procedures.
- Work within a team environment.
- Verify numerical output of computer programs.
- Use computer terminology.
- Apply mathematical algorithms and data structures.
- Apply logical and statistical techniques to develop test suites.
- Write business correspondence.
- Write technical reports.
- Make oral presentations.
- Use personal communication tools, including office productivity tools, e-mail, and internet browsers.
- Understand business functions and process flow.
- Use core accounting terminology.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- One year of high school algebra or equivalent
- Ability to use computer keyboard and mouse
- Interview with Programmer/Analyst faculty

### MATH LEVEL

Students should have mastered basic math and algebra 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 an Applications Programmer/Analyst in a microcomputer, midrange, or mainframe environment or as a Database Programmer.

### APPLICATIONS PROGRAMMER/ANALYST:

gathers and analyzes facts to determine the problem, writes specifications, designs a solution, and develops the program to implement the solution on the computer.

**DATABASE PROGRAMMER:** develops application programs which access and maintain databases; develops software procedures attached to a database (stored procedures) to implement business rules for applications using the database.

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

- Database Administrator
- Information Technology Department Manager
- Systems Analyst
- Systems Programmer
- Senior Programmer/Analyst
- Database Analyst
- Applications Project Manager
- Software Integrator

**NOTE:** To train entry-level programmers in two years requires a rigorous academic schedule and a strong commitment by the student and by the instructors. The schedule has been carefully designed so that one semester prepares a student for the next semester. Deviation from this schedule can hinder progress and adversely affect the chances of successful completion.

### CURRICULUM

The Programmer/Analyst Associate Degree is a two-year, four-semester program. Upon graduation, a student will have completed 69 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-107-111	Computer: Programming 1-VB.NET	4
10-107-112	Computer: Concept/Appl	3
10-107-115	Computer: AS400-Introduction	2
10-801-195	Communication-Written	3
10-804-151	Math-Data Proc Logic	3
<b>SEMESTER TOTAL</b>		<b>15</b>

#### SECOND SEMESTER

10-101-110	Accounting 1	4
10-107-121	Computer: Programming 2-COBOL	4
OR		
10-107-122	Computer: Programming 2-RPG	4
10-107-123	Computer: Database Concepts	4
10-801-197	Reporting-Technical	3
10-804-161	Math-Data Proc Alg/Stat	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### THIRD SEMESTER

10-107-131	Computer: Systems Analy/Des	4
10-107-132	Computer: Programming 3-Java	4
10-107-134	Computer: Control Language Pro	2
10-801-196	Oral/Interpersonal Comm	3
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>19</b>

#### FOURTH SEMESTER

10-107-147	Computer: Server-Side Prog	3
10-107-148	Computer: Client-Side Prog	3
10-107-149	Computer: Project	2
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>17</b>

**SUGGESTED ELECTIVES:** Computer: HTML-Intro (10-107-104), Micro Programming C++ (10-107-173), Computer: VisualBasic-Adv (10-107-175), Web: Connectivity (10-107-124), Web: Database Development (10-107-125), Web: Server Side Script-Unix (10-107-128), Web: Server Side Scripting-MS (10-107-129)

This program is fully eligible for financial aid.

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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.

**10-107-111 COMPUTER: PROGRAMMING 1-VISUAL BASIC.NET** ...programming and problem solving using the Visual Basic language (.NET), design and develop Visual Basic interactive programs using structured techniques including array processing, stream files, and database retrieval. (Corequisites: 10-107-112, Computer:Concepts/Applications and 10-804-151, Math-Data Proc Logic)

**10-107-112 COMPUTER: CONCEPTS/APPLICATIONS** ...hardware components of a computer system, computer software, file and database processing and management, communications, management information systems, the information systems life cycle, computer career opportunities, and computer trends and issues.

**10-107-115 COMPUTER: AS400-INTRODUCTION** ...use systems utilities (Program Development Manager, Source Entry Utility, Data File Utility, Query Utility), design and create data stores, execute programs, generate reports, use Control Language interactively to perform tasks. (Corequisite: 10-107-112, Computer:Concepts/Applications)

**10-107-121 COMPUTER: PROGRAMMING 2-COBOL** ...programming and problem solving using the COBOL language (ANSI-85), design and develop COBOL batch and interactive programs using structured techniques, including table processing and file maintenance. (Prerequisites: 10-107-111, Computer:Programming 1-Visual Basic.NET and 10-107-115, Computer:Intro to AS400)

**10-107-122 COMPUTER: PROGRAMMING 2-RPG** ...programming and problem solving using the RPG IV language, design and develop RPG IV batch and interactive programs using structured techniques, including array and data structure processing and file maintenance. (Prerequisites: 10-107-111, Computer: Programming 1-Visual Basic.NET and 10-107-115, Computer:Intro to AS400)

**10-107-123 COMPUTER: DATABASE CONCEPTS** ...data and its function; traditional, hierarchical, network, relational data models; relational algebra, logical files, structured query language, normalization, database constraint; database management systems (DBMS) functions and applications. (Prerequisites: 10-107-111, Computer:Programming 1-Visual Basic.NET and 10-107-112, Computer:Concepts/Applications)

**10-107-131 COMPUTER: SYSTEMS ANALYSIS/DESIGN** ...system development methodologies, analysis/design tools, skills in analysis of business problems, overview of design considerations for user interface, application of database methods, testing methods, documentation requirements. Accounting familiarity required. (Prerequisite: 10-107-121, Computer:Programming 2-COBOL or 10-107-122, Computer:Programming 2-RPG)

**10-107-132 COMPUTER: PROGRAMMING 3-JAVA** ...programming and problem solving using the Java language and object-oriented software development techniques, design and develop Java source for class definitions and for applications using objects based on class definitions. (Prerequisite: 10-107-121, Computer:Programming 2-COBOL or 10-107-122, Computer:Programming 2-RPG)

**10-107-134 COMPUTER: CONTROL LANGUAGE PROGRAMMING** ...functions of system/job control language, development of CL programs to utilize variables, control program flow, display menus/messages, handle error conditions, and access databases. (Prerequisite: 10-107-121, Computer: Programming 2-COBOL or 10-107-122, Computer: Programming 2-RPG)

**10-107-147 COMPUTER: SERVER-SIDE PROGRAMMING** ...design and implement databases, design and develop stored procedures for a database, design and develop business-rule tiers. Requires three semesters of programming, one of which is advanced. (Prerequisites: 10-107-123, Computer:Database Concepts and 10-107-131, Computer:Systems Analysis/Design)

**10-107-148 COMPUTER: CLIENT-SIDE PROGRAMMING** ...design/develop user interface applications to interact with database servers, design/develop web-based interface applications to interact with database servers. Requires three semesters of programming, one of which is advanced. (Prerequisites: 10-107-123, Computer:Database Concepts and 10-107-131, Computer:Systems Analysis/Design)

**10-107-149 COMPUTER: PROJECT** ...define, schedule, plan, implement, monitor, and evaluate a software development project. Course should be taken concurrently with or after completing all fourth semester technical courses.

# Radiography

Program Code 105261

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### 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 our program, many students may choose to acquire advanced certificates in Mammography, Bone Densitometry, Computed Tomography (CT) and/or Magnetic Resonance Imaging (MRI).

Graduates of the Radiography - Associate Degree Program will be able to:

- Apply fundamentals of radiologic science and health care.
- Apply ethics and law in the radiologic sciences.
- Use medical terminology.
- Perform patient care in radiologic sciences.
- Apply human structure and function.
- Perform radiographic procedures.
- Perform imaging and processing.
- Use imaging equipment.
- Perform image analysis.
- Assess radiation production characteristics.
- Apply radiation protection.
- Apply radiation biology.
- Explain radiation pathology.
- Use computers in radiologic sciences.
- Apply pharmacology and drug administration.
- Perform clinical practice.
- Respect human diversity.

Students will be required to purchase a nametag, provide their own transportation to clinical facilities, pay for liability insurance for each clinical course, and cover any other expenses related to their fieldwork experiences.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

All students are required to complete an American Heart Association Health Care Provider CPR course and are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.

### 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, technical advisors, etc.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalency
- High school chemistry or equivalent
- High school algebra or equivalent
- All students are expected to have entry-level computer skills. If a candidate is unsure of their skills, the learning center basic computer skills coursework is recommended (self-choice).
- Upon invitation, must write the Accuplacer test. ACT scores may be accepted in place of the Accuplacer (students with an overall score of 20 or higher, along with acceptable ACT scores in Math, Reading, and English, will not be required to write the Accuplacer).
- Completion of a physical examination.

### MATH LEVEL

Students should have 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 above requirements should consult with an NWTC counselor about ways to meet deficiencies through testing or course work.

### CURRICULUM

The Radiography program is a two-year, two-summer, four-semester program. Upon graduation, a student will have completed 68 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-526-149	RT-Anatomy & Procedures 1	5
* 10-526-158	RT-Intro to Radiography	2
* 10-526-159	RT-Imaging 1	3
* 10-526-168	RT-Clinical Practice 1	2
10-806-177	Gen Anatomy & Physiology	4
<b>SEMESTER TOTAL</b>		<b>16</b>

#### SECOND SEMESTER

* 10-526-170	RT-Imaging 2	3
* 10-526-191	RT-Anatomy & Procedures 2	5
* 10-526-192	RT-Clinical Practice 2	4
10-801-195	Communication-Written	3
10-809-198	Intro to Psychology	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### THIRD SEMESTER

* 10-526-193	RT-Clinical Practice 3	2
	Elective	3
<b>SEMESTER TOTAL</b>		<b>5</b>

#### FOURTH SEMESTER

* 10-526-194	RT-Imaging Equip & Computers	4
* 10-526-195	RT-Image Analysis	2
* 10-526-196	RT-Modalities	1
* 10-526-199	RT-Clinical Practice 4	5
10-801-196	Oral/Interpersonal Comm	3
<b>SEMESTER TOTAL</b>		<b>15</b>

#### FIFTH SEMESTER

* 10-526-201	RT-Radiographic Pathology	1
* 10-526-202	RT-Clinical Practice 5	2
* 10-526-203	RT-Radiation Protect & Biology	3
10-809-195	Economics	3
10-809-196	Intro to Sociology	3
<b>SEMESTER TOTAL</b>		<b>12</b>

#### SIXTH SEMESTER

* 10-526-204	RT-Clinical Practice 6	2
<b>SEMESTER TOTAL</b>		<b>2</b>

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Radiography students must fulfill this requirement.

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue in or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

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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.

**10-526-149 RT-RADIOGRAPHIC ANATOMY & PROCEDURES 1** ...prepares radiography students to perform routine radiologic procedures on various parts of the body including the upper and lower extremities, hip and pelvis. (Prerequisite: Enrolled in Radiography program)

**10-526-158 RT-INTRODUCTION TO RADIOGRAPHY** ...introduces students to the role of radiography in health care. Students apply legal and ethical considerations to patient care and pharmacology in radiologic sciences. (Prerequisite: Enrolled in Radiography program)

**10-526-159 RT-RADIOGRAPHIC IMAGING 1** ...introduces radiography students to the process of creating radiographic images. Students determine the factors that affect image quality. Students apply OSHA standards for health and safety in the darkroom. (Prerequisite: Enrolled in Radiography program)

**10-526-168 RT-RADIOGRAPHY CLINICAL PRACTICE 1** ...this beginning level clinical course prepares radiography students to perform radiologic procedures on patients with extensive supervision and direction. An emphasis of the course is development of communication and critical thinking skills appropriate to the clinical setting. (Prerequisite: Enrolled in Radiography program)

**10-526-170 RT-RADIOGRAPHIC IMAGING 2** ...prepares radiography students to apply advanced radiographic principles to the production of radiographic images. Students analyze exposure factor considerations, differentiate between film and exposure latitude, and beam restricting devices. (Prerequisite: 10-526-159, RT-Radiographic Imaging 1)

**10-526-191 RT-RADIOGRAPHIC ANATOMY & PROCEDURES 2** ...prepares radiography students to perform routine radiologic procedures on various parts of the body including the skull and spine. (Prerequisite: 10-526-149, RT-Radiographic Anatomy & Procedures 1)

**10-526-192 RT-RADIOGRAPHY CLINICAL PRACTICE 2** ...this second level clinical course prepares radiography students to perform radiologic procedures on patients with extensive supervision and direction. An emphasis of the course is the development of communication and critical thinking skills appropriate to the clinical setting. (Prerequisite: 10-526-168, RT-Radiography Clinical Practice 1)

**10-526-193 RT-RADIOGRAPHY CLINICAL PRACTICE 3** ...this third level clinical course prepares radiography students to perform radiologic procedures on patients with supervision and direction. An emphasis of the course is the demonstration of communication and critical thinking skills appropriate to the clinical setting. (Prerequisite: 10-526-192 RT-Radiography Clinical Practice 2)

**10-526-195 RT-RADIOGRAPHIC IMAGE 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: 10-526-170, RT-Radiographic Imaging 2)

**10-526-199 RT-RADIOGRAPHY CLINICAL PRACTICE 4** ...this fourth level clinical course prepares radiography students to perform radiologic procedures on patients with supervision and direction. Students are encouraged to demonstrate independent judgment in the performance of clinical competencies. (Prerequisite: 10-526-193, RT Radiography Clinical Practice 3)

**10-526-201 RT-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: 10-526-195, RT-Radiographic Image Analysis)

**10-526-202 RT-RADIOGRAPHY CLINICAL PRACTICE 5** ...this fifth level clinical course prepares radiography students to perform radiologic procedures on patients with some supervision. Students are encouraged to demonstrate independent judgment in the performance of clinical competencies. (Prerequisite: 10-526-199, RT-Radiography Clinical Practice 4)

**10-526-204 RT-RADIOGRAPHY CLINICAL PRACTICE 6** ...this final clinical course requires students to integrate and apply all knowledge learned in previous courses to the production of high quality radiographs in the clinical setting. (Prerequisite: 10-526-202, RT-Radiography Clinical Practice 5)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Respiratory Care Practitioner

Program Code 105151

## ASSOCIATE DEGREE - TWO YEARS PLUS ONE SUMMER

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Respiratory Care Practitioner trains students in the diagnosis, treatment, and rehabilitation of patients with chronic and acute diseases of the heart and lungs.

Graduates of the Respiratory Care Practitioner Program will be able to

- Practice as a competent advanced-level Respiratory Care Practitioner.
- Comprehend, apply and evaluate clinical information pertinent to the role of an advanced respiratory care practitioner.
- Demonstrate the technical skills necessary to fulfill the role of an advanced-level Respiratory Care Practitioner.
- Demonstrate the affective skills necessary to administer patient care consistent with professional and employer expectations for an advanced respiratory care practitioner.
- Demonstrate a strong professional work ethic in regard to social awareness and diversity.
- Make decisions about patient respiratory care using critical thinking and problem solving skills.
- Apply scientific concepts relating to Physics, Microbiology, Anatomy and Physiology in an effort to recommend and modify respiratory treatment for patient care.
- Demonstrate interpersonal communication skills with respect for patient confidentiality.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- Minimum standard composite score of 20 on the ACT assessment
- High school diploma or equivalent
- High school algebra (or attain a minimum score of 80% on the NWTC Algebra examination)
- One year of biology or equivalent
- One year of chemistry or equivalent
- One year of physics or advanced mathematics (all with grades of C or better)
- Complete an interview or orientation
- A medical examination form satisfactorily completed within three months before beginning the program
- All students are required to complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card (one year renewal cycle to comply with affiliating agencies may be required

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Respiratory Care Practitioner in the hospital setting as a Staff Therapist, a Pulmonary Rehabilitation Therapist, a Perinatal/Pediatric Therapist, a Pulmonary Function Technologist/Therapist, a Sleep Disorder Center Technician, a Shift Supervisor, and a Department Manager. Outside of the hospital setting, a graduate will have the potential for employment as a Home Care Therapist and/or Manager, a Nursing Home Therapist, Respiratory Care Educator, and Medical Equipment Supplies Salesperson.

**STAFF THERAPIST:** (hospital setting) performs all respiratory care modalities and monitors lifesupport systems in all areas of the hospital during a twenty-four hour period.

**PULMONARY REHABILITATION THERAPIST:** works in conjunction with other allied health practitioners and physicians with patients affected by chronic lung/heart disease, with a goal to improve the quality of life for these special patients. A graduate would work with a variety of age groups and physical impairments.

**PERINATAL/PEDIATRIC THERAPIST:** (considered a specialized area of expertise) works in a neonatal intensive care unit, stepdown unit with children and their families, as well as the physicians and nurses assigned to the same units.

**PULMONARY FUNCTION TECHNOLOGIST/THERAPIST:** works in a diagnostic laboratory setting that emphasizes the testing of lung dysfunction via a variety of pulmonary tests and stress tests, and may also be required to draw arterial blood samples.

**SLEEP DISORDER CENTER TECHNICIAN:** (considered a specialized area of practice) performs and monitors tests designed to detect specific sleep disorders, working closely with physicians, patients, and family members.

**SHIFT SUPERVISOR:** a first-line management position, supervises the activities and performance of respiratory care practitioners assigned to a specific shift. Many managerial skills and duties are required in this capacity.

**DEPARTMENT MANAGER:** a mid-level management position, is responsible for the overall managerial duties and supervision of all departmental employees in the general hospital environment and the specialty departments.

### HOME CARE THERAPIST/MANAGER:

employed by a home health care agency, usually outside the hospital setting, makes visits to patients in their homes to check equipment setups, adherence to a prescribed therapy, and medication plans. The manager supervises and is responsible for all services and personnel utilized in the home health company. Traveling and working hours will vary depending upon patient location and needs.

**NURSING HOME THERAPIST:** (a new role for the respiratory care profession) performs and monitors the respiratory care modalities being administered to nursing home patients.

**RESPIRATORY CARE EDUCATOR:** works in clinical or classroom setting either as a full-time or part-time instructor for a respiratory care practitioner program, and typically requires advanced respiratory care credentials and education.

**MEDICAL EQUIPMENT AND SUPPLIES SALES REPRESENTATIVE:** employed by a specific medical company as a sales representative for all medical equipment/supplies offered by that company, or may specialize in an area of equipment and supplies. Salary is variable and travel can be extensive.

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

- Electric Physiology Lab Technician
- EKG Technician
- Physician Assistant

### MATH LEVEL

Students should have mastered basic math skills and Accuplacer tests for algebra. For a description of basic math, see the Basic Education section of this catalog.

**NOTE:** A student who does not meet the above requirements should consult an NWTC counselor about ways to make up any deficiencies through testing or course work.

The Respiratory Care Practitioner program is accredited by the Committee on Accreditation for Respiratory Care (CoARC)

1248 Harwood Road  
Bedford, TX 76021-4244  
(817) 283-2835

A graduate is eligible to take the National Board for Respiratory Care Credentialing Examinations.

## CURRICULUM

The Respiratory Care Practitioner Associate Degree is a two-year, one-summer, five-semester program. Upon graduation, a student will have completed 72 credits.

### FIRST SEMESTER

Course No.	Description	Credits
* 10-515-111	Respiratory Care-Intro	2
10-801-196	Oral/Interpersonal Comm	3
* 10-806-115	Physics-RCP	3
10-806-177	Gen Anatomy & Physiology	4
10-809-198	Intro to Psychology	3
	Elective	2
	<b>SEMESTER TOTAL</b>	<b>17</b>

### SECOND SEMESTER

* 10-515-125	Respiratory Care Tech 1	3
* 10-515-151	Pharmacology	2
* 10-515-189	RCP-Pathophysiology/Cardio	3
10-801-195	Communication-Written	3
10-806-197	Microbiology	4
	Elective	1
	<b>SEMESTER TOTAL</b>	<b>16</b>

### SUMMER SEMESTER

* 10-515-132	Respiratory Care Tech 2	3
* 10-515-139	Respiratory Care Clinical 1	2
	<b>SEMESTER TOTAL</b>	<b>5</b>

### THIRD SEMESTER

* 10-515-134	Cardiopulmonary Diseases	3
* 10-515-135	Pulmonary Function	2
* 10-515-138	Ventilation-Mechanical	3
* 10-515-144	Respiratory Care Clinical 2A	3
* 10-515-145	Respiratory Care Clinical 2B	3
10-809-196	Intro to Sociology	3
	<b>SEMESTER TOTAL</b>	<b>17</b>

### FOURTH SEMESTER

* 10-515-143	Critical Care	3
* 10-515-147	Respiratory-Neonatal/Ped	2
* 10-515-157	Respiratory Care Clinical 3A	3
* 10-515-158	Respiratory Care Clinical 3B	3
10-809-195	Economics	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>17</b>

**SUGGESTED ELECTIVES:** Clinical Simulation Review (10-515-162), Clinical Simulation Review 2 (10-515-163), Word-Intro (10-103-121), and Excel-Intro (10-103-131).

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Respiratory Care Practitioner students must fulfill this requirement.

**NOTE:** No final grade lower than C is acceptable in any of the courses marked with an asterisk. A student must repeat that particular course to achieve a C or better final grade in order to continue or graduate from this program. If the course is segmented, the successful retake must occur before continuing the sequence.

This program is fully eligible for financial aid.

## COURSE DESCRIPTIONS

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

### 10-515-111 RESPIRATORY CARE-INTRODUCTION

...Health Care Delivery Systems, Patient/Practitioner Education, Respiratory Care/Services, Medical Terminology, Patient/Practitioner Safety, Communication Skills, Medical Record Keeping, Charting Methods, Infection Control, Patient Care Ethics, and Medical Gas/Cylinder Safety.

### 10-515-125 RESPIRATORY CARE TECHNOLOGY 1

...cardiovascular system, bedside assessment, gas exchange/transport, medical gas therapy, humidity/bland aerosol therapy, aerosol drug therapy. (Prerequisites: 10-515-111, Respiratory Care-Intro; 10-806-115, Physics-RCP)

### 10-515-132 RESPIRATORY CARE TECHNOLOGY 2

...rationale and indications of incentive spirometry, chest physiotherapy, breathing exercises, non-invasive patient monitoring techniques, pulmonary rehabilitation, home-care methodologies, rationale and equipment utilized for CPAP, and manual ventilation. (Prerequisite: 10-515-125, Respiratory Care Technician 1)

### 10-515-134 CARDIOPULMONARY DISEASES

...this course provides the opportunity for the learner to develop the knowledge, skills, process, and understanding of: therapist-driven protocols, obstructive, infections, pulmonary vascular, chest/pleural trauma, pleural/chest wall disorders, environmental, neoplastic, diffuse alveolar, chronic noninfectious, neurological disorders/sleep apnea, and other important disorders. (Prerequisite: 10-515-189, Physiology-Cardio/Renal)

**10-515-135 PULMONARY FUNCTION**...advanced diagnostics of cardio-pulmonary disorders via complete pulmonary function testing, pulmonary stress testing, arterial blood gas analysis, instrumentation and interpretation. (Prerequisites: 10-806-115, Physics-RCP; 10-515-132, Respiratory Care Tech 2)

### 10-515-138 VENTILATION-MECHANICAL

...principles, operation, and application of devices for ventilatory assistance and support; study of the patient-ventilator interface; artificial airways; ventilatory failure; and physiological alterations from mechanical ventilation. (Prerequisites: 10-806-115, Physics-RCP; 10-515-132, Respiratory Care Tech 2. Corequisites: 10-515-144, Respiratory Care Clinical 2A; 10-515-145, Respiratory Care Clinical 2B)

### 10-515-139 RESPIRATORY CARE CLINICAL 1

...respiratory care in a clinical environment, observation of administration of respiratory therapy modalities, and workshops to enhance skills taught in Respiratory Care-Introduction and Respiratory Care Technology 1. (Prerequisites: 10-515-125, Respiratory Care Tech 1; 10-515-151, Pharmacology)

**10-515-143 CRITICAL CARE** ...management of the critically ill patient including noninvasive and invasive patient monitoring techniques and evaluation, special procedures, acute and chronic respiratory failure, heart failure, trauma and simulations specific to critical care.

### 10-515-144 RESPIRATORY CARE CLINICAL 2A

...minimum of 24-hours per week in clinical settings with emphasis on performance of respiratory procedures and application of equipment; limited patient care responsibilities. (Prerequisite: 10-515-139, Respiratory Care Clinical 1; Corequisite: 10-515-145, Respiratory Care Clinical 2B)

### 10-515-145 RESPIRATORY CARE CLINICAL 2 B

...continuation of a minimum of 24-hours per week in clinical settings with emphasis on performance of respiratory procedures and application of equipment; limited patient care responsibilities. (Prerequisite: 10-515-139, Respiratory Care Clinical 1; Corequisite: 10-515-144, Respiratory Care Clinical 2A)

### 10-515-147 RESPIRATORY CARE-NEONATAL/PEDIATRIC

...embryology fetal maturity, birth, assessment, neonatal abnormalities, congenital heart abnormalities, non-invasive and invasive care, croup, epiglottitis, bronchiolitis vs. asthma, Reye's Syndrome and Cystic Fibrosis. (Prerequisite: 10-515-138, Ventilation-Mechanical; Corequisite: 10-515-143, Critical Care)

**10-515-151 PHARMACOLOGY** ...drug dosages, central and peripheral nervous system, sympathomimetic bronchodilators, Xanthine bronchodilators, mucolytics, corticosteroids, antiasthmatic drugs, neuromuscular blocking agents, central nervous system depressants, respiratory stimulants, and cardiovascular agents. (Prerequisites: 10-515-111, Respiratory Care-Intro; 10-806-193, Anatomy/Physiology-General)

### 10-515-157 RESPIRATORY CARE CLINICAL 3 A

...administration of respiratory care to the critically ill, neonatal, and pediatric patient; ventilatory management; and evaluation skills. (Prerequisites: 10-515-144, Respiratory Care Clinical 2A and 10-515-145, Respiratory Care Clinical 2B; Corequisite: 10-515-158, Respiratory Care Clinical 3B)

### 10-515-158 RESPIRATORY CARE CLINICAL 3B

...continuation of administration of respiratory care to the critically ill, neonatal, and pediatric patient; ventilatory management; and evaluation skills. (Prerequisites: 10-515-144, Respiratory Care Clinical 2A and 10-515-145, Respiratory Care Clinical 2B; Corequisite: 10-515-157, Respiratory Care Clinical 3A)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Retail Management

Program Code 101047

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5435. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Retail Management program prepares students for entry-level management in the retail industry. Graduates are trained in merchandising techniques and management strategies pertaining to all facets of retailing.

Graduates of this program will be able to:

- Recommend a retail pricing plan.
- Evaluate alternative distribution strategies.
- Develop a retail product and service mix.
- Generate retail information for effective decision making.
- Apply continuous improvement strategies to solve retail problems.
- Assess emerging global trade events that impact retailing.
- Create a personal professional development plan.
- Manage resources and risks to contribute to profitability of the organization.
- Manage retailing within an enterprise.
- Apply technology to retail and retail information systems.
- Apply legal and ethical principles to personal, social, and professional behaviors.
- Develop long-term strategic retail marketing plans.
- Formulate retail selling strategies.
- Apply effective leadership skills.
- Design a retail promotion plan.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard

### MATH LEVEL

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 Manager Trainee, Department Manager, Assistant Store Manager, Assistant Buyer, Distributor/Planner Trainee, Market Research Assistant, Merchandiser, or Human Resource Specialist.

**MANAGER TRAINEE:** works within a rotation among the various departments and functions in a firm becoming familiar with all operations, and works with computer printouts.

**DEPARTMENT MANAGER:** supervises sales staff within the department, assigns duties, trains staff, evaluates employees' performance, supervises merchandise presentations, submits reports and analyzes inventory and stock control within a department, assists in sales when necessary, and initiates store communication.

**ASSISTANT STORE MANAGER:** supervises and schedules the sales staff, supervises merchandise presentations, opens and closes the store, submits reports, analyzes inventory and stock control within a department, assists in sales when necessary, and initiates store communication.

**ASSISTANT BUYER:** works with the merchandiser developing the line, assists in determining the merchandise to be included and the price points of merchandise, keeps clerical records for the buyer, follows up on merchandise shipments, initiates store communication, and works with computer printouts.

**DISTRIBUTOR/PLANNER TRAINEE:** determines the allocation of merchandise to various store units; works with computer printouts and unit control records; has contact with buyers, merchandise managers, and store personnel in a retail environment.

**MARKET RESEARCH ASSISTANT:** researches market conditions to determine potential sales, examines and assists in analyzing data to forecast future trends, prepares reports, and works with computer printouts.

**MERCHANDISER:** determines the merchandise selection in cooperation with a buyer or corporate management, responsible for the "presentation" of the merchandise in the department or store, tracks the "flow" of merchandise.

**HUMAN RESOURCE SPECIALIST:** analyzes retail functions and job descriptions; recruits, trains, assesses, and motivates employees.

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

- Buyer
- Entrepreneur
- Replenishment Manager
- Store Manager

### CURRICULUM

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

#### FIRST SEMESTER

Course No.	Description	Credits
10-102-158	Business-Intro	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-141	Micro: Access-Intro	1
10-104-101	Selling Principles	3
10-104-190	Retail Principles	3
10-801-195	Communication-Written	3
10-804-101	Math-Business	3
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

10-104-110	Marketing Principles	3
10-104-191	Customer Service Mgmt	3
10-104-192	Merchandise Management	3
10-801-198	Speech	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>15</b>

#### THIRD SEMESTER

10-104-193	Retail Operations Mgmt	3
10-196-189	Team Building/Prob Solve	3
10-196-193	Human Resource Mgmt	3
10-809-195	Economics	3
10-809-199	Psychology-Human Rel	3
<b>SEMESTER TOTAL</b>		<b>15</b>

#### FOURTH SEMESTER

10-104-135	Retail Mgmt-Survival OR	3
10-196-164	Supervisors-Personal Skills	3
10-104-164	Retail Mgmt Internship OR	3
10-104-180	Retail Mgmt Field Study	3
10-104-189	Sales Management	3
10-182-130	E-Comm Logistics/Fulfill	3
10-809-197	Society-Amer Contemp	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>18</b>

**SUGGESTED ELECTIVES:** Diversity & Change Management (10-196-169), Leadership Development (10-196-190), Ethics (10-196-199)

This program is fully eligible for financial aid.

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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.

**10-104-101 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.

**10-104-135 RETAIL MANAGEMENT-SURVIVAL SKILLS** ...review of current federal and state employment laws and employers' responsibilities; sources, consequences, and methods of handling stress; techniques and strategies of time management; sexual harassment; cultural/etiquette issues.

**10-104-164 RETAIL MANAGEMENT INTERNSHIP** ...professional work environment, interviewing techniques, sales, product knowledge, business operations, management awareness, inventory records/recordkeeping techniques with supervision/evaluation facilitated by instructor and contract training person.

**10-104-180 RETAIL MANAGEMENT FIELD STUDY** ...examine a product or business career of major interest to the student through a research project that is student selected and instructor approved.

**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.

**10-104-190 RETAIL PRINCIPLES** ...macro issues facing retailers, including structural dynamics; strategic planning, environmental factors; consumer behavior; site selection; selecting markets in which to compete; and retailing issues, opportunities, and outlook.

**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.

**10-104-193 RETAIL OPERATIONS MANAGEMENT** ...management of a retail store operation including retail planning and control; retail information systems; and human resource management including placement, orientation, evaluation, recruiting, interviewing, discipline, performance problems, and training.

**10-182-130 E-COMMERCE LOGISTICS/ FULFILLMENT** ...e-commerce, business-to-business e-commerce, consumer e-commerce, e-commerce distribution, e-procurement, e-commerce connection, legal and ethical issues, and e-commerce logistics applications.

**10-196-164 SUPERVISORS-PERSONAL SKILLS** ...time management, stress, and related challenges to a supervisor, personal planning, valuing rights and responsibilities of others, effective communication, and assertiveness.

**10-196-189 TEAM BUILDING/PROBLEM SOLVING** ...benefits and challenges of group work, necessary roles in a team, stages of team development, different approaches to problem solving, consensus, data acquisition, analysis, developing alternative solutions, implementation and evaluation.

**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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Speech-Language Pathologist Assistant

## ASSOCIATE DEGREE - SIX SEMESTERS

Program Code 105321

Offered at the Green Bay campus. Admissions, registration or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

The Speech-Language Pathologist Assistant program prepares students to work under the supervision of a certified and licensed Speech-Language Pathologist who evaluates, diagnoses, and treats individuals with communication and swallowing disorders.

Graduates of the Speech-Language Pathologist Assistant program, under the supervision of a certified, licensed Speech-Language Pathologist, will be able to:

- Use effective oral and written communication
- Demonstrate effective interpersonal skills with clients, caregivers, and other professionals.
- Employ time management skills.
- Use current technology related to the treatment of communication disorders.
- Conduct speech, language, and hearing screenings without interpretation.
- Follow documented treatment plans developed by supervising Speech-Language Pathologist.
- Document client performance and report information to supervising Speech-Language Pathologist.
- Assist the Speech-Language Pathologist during assessment of clients.
- Assist with departmental operations (scheduling chart preparation, record-keeping, clerical duties, preparing materials).
- Maintain equipment and materials.
- Support the Speech-Language Pathologist in research projects, data collection, in-service training, and public relations programs.
- Exhibit compliance with regulations, reimbursement, and SLPA job responsibilities.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

### EMPLOYMENT POTENTIAL

A graduate of this program will have the potential for employment as a Speech-Language Pathologist Assistant. This is an emerging occupation and the job outlook is not fully predictable. However, the U.S. Department of Labor Occupational Outlook Handbook (2002-2003) predicts the growth in Speech-Language Pathology will be much faster than average (30% or more) through the year 2010. Speech Language Pathologist Assistants support the services of a Speech Language Pathologist for a more efficient model of service delivery.

### SPEECH-LANGUAGE PATHOLOGIST

**ASSISTANT:** performs speech-language screens, carries out treatment plans, observes and reports patient's responses, assists with assessment, schedules activities, prepares charts, performs maintenance of equipment, all under the supervision of a certified-licensed Speech-Language Pathologist.

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

- Speech-Language Pathologist

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent
- One year Biology and Chemistry or equivalent
- A minimum standard ACT score of 20 or achieve established program benchmarks on Accuplacer
- Medical examination within three months prior to program entry
- Caregiver background check
- AHA Health Care Provider CPR course prior to fourth semester

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### CURRICULUM

The Speech-Language Pathologist Assistant Associate Degree is a six-semester program. Upon graduation, a student will have completed 70 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-121	Micro: Word-Introduction	1
10-801-196	Oral/Interpersonal Comm	3
10-809-198	Intro to Psychology	3
<b>SEMESTER TOTAL</b>		<b>7</b>

#### SECOND SEMESTER

* 10-532-111	SLPA-Intro	3
* 10-532-113	SLPA-Phonetics	3
10-801-195	Communication-Written	3
10-806-177	Gen Anatomy & Physiology	4
10-809-188	Developmental Psychology	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### THIRD SEMESTER

10-103-151	Micro: PowerPoint-Intro	1
* 10-532-123	SLPA-Speech/Lang Develop	3
* 10-532-124	SLPA-Aural Rehabilitation	3
* 10-532-125	SLPA-Therapy Basics	3
10-809-196	Intro to Sociology	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>16</b>

#### FOURTH SEMESTER

* 10-532-131	SLPA-Clinic	2
* 10-532-132	SLPA-Swallowing Disorders	2
* 10-532-133	SLPA-Assistive Technology	2
<b>SEMESTER TOTAL</b>		<b>6</b>

#### FIFTH SEMESTER

10-160-111	Health Care Overview	2
* 10-532-137	SLPA-Speech Disorders/Treat	3
* 10-532-138	SLPA-Language Disorders/Treat	3
* 10-532-139	SLPA-Clinical Procedures	2
* 10-532-140	SLPA-Treatment Lab	2
<b>SEMESTER TOTAL</b>		<b>12</b>

#### SIXTH SEMESTER

10-103-131	Micro: Excel-Introduction	1
* 10-532-145	SLPA-Ethical Decision-Make	1
* 10-532-146	SLPA-Fieldwork	5
10-809-199	Psychology-Human Rel	3
	Elective	3
<b>SEMESTER TOTAL</b>		<b>13</b>

**NOTE:** A grade of C or better is required in all courses marked with an asterisk in order to continue in, or graduate from, the program.

High school chemistry or Chemistry-Basic (10-806-155) is a prerequisite for General Anatomy & Physiology (10-806-177). All Speech-Language Pathologist Assistant students must fulfill this requirement.

This program is fully eligible for financial aid.

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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:

**10-532-111 SLPA-INTRODUCTION** ...scope of practice, licensing and certification of SLP, responsibilities and registration of SLPA, professional resources, communication, introduction to communication disorders, public school system, health care system, interdisciplinary team member roles and clinical observations.

**10-532-113 SLPA-PHONETICS** ...speech science, respiratory system, phonatory system, articulatory system, nervous system, speech sound classification, phonetic alphabet, transcriptional phonetics, application of transcription skills. (Prerequisite: 10-532-111, SLPA Intro; Accepted into the Speech Language Pathologist Assistant program)

**10-532-123 SLPA-SPEECH/LANGUAGE DEVELOPMENT** ...neurolinguistics, semantic development, syntactic development, morphologic development, pragmatic development, application of skills through cultural-linguistic diversity field experiences, language sample, phonological development, delayed and disordered speech-language, and communication changes with aging. (Prerequisite: 10-532-111, SLPA-Intro)

**10-532-124 SLPA-AURAL REHABILITATION** ...speech perception, aural rehabilitation, basic audiology, clinical observations, hearing screenings, amplification devices, aural habilitation of children, aural rehabilitation of adults, aural rehabilitation of older adults, application of skills, through case study, role play and field experiences. (Prerequisite: 10-532-111, SLPA-Intro)

**10-532-125 SLPA-THERAPY BASICS** ...basic intervention methods, behavior management strategies, cues, interpret SLP goals, plan treatment session, manage treatment session, document client responses, NWTC Communication Clinic Policies & Procedures, Earobics software, Speechviewer III and literacy. (Prerequisite: 10-532-113, SLPA-Phonetics; Corequisites: 10-532-123, SLPA-Speech/Language Development; 10-532-124, SLPA-Aural Rehabilitation)

**10-532-131 SLPA-CLINIC** ..basic intervention methods, behavior management strategies, cues, interpret SLP goals, plan treatment session, manage treatment session, document client responses, SOAP note format, NWTC Communication Clinic Policies & Procedures, self assessment. (Prerequisite: 10-532-125, SLPA Therapy Basics)

**10-532-132 SLPA-SWALLOWING DISORDERS AND TREATMENT** ...normal swallow, abnormal swallow, fluoroscopic tray set-up, food textures, treatment, nutrition, pediatric dysphagia, and clinical observations. (Prerequisite: 10-532-113, SLPA-Phonetics)

**10-532-133 SLPA-ASSISTIVE TECHNOLOGY** ...augmentative/alternative communication, unaided communication, aided communication, intervention strategies, funding, resources, case studies and clinical observations. (Prerequisite: 10-532-123, SLPA-Speech/Language Development)

**10-532-137 SLPA-SPEECH DISORDERS/TREATMENT** ...articulation and treatment, phonological disorders/treatment, apraxia and treatment, dysarthria and treatment, stuttering and treatment, voice disorders and treatment, materials, resources, observations and competency check-offs. (Prerequisites: 10-532-131, SLPA Clinic; 10-806-177, Anatomy & Physiology-General)

**10-532-138 SLPA-LANGUAGE DISORDERS/TREATMENT** ...language disorders/treatment children, language disorders/treatment adolescents, aphasia and treatment, right hemisphere disorders and treatment, brain injury and treatment, Dementia and treatment, materials, resources, observations, and competency check-offs. (Prerequisites: 10-532-131, SLPA Clinic; 10-806-177, Anatomy & Physiology-General)

**10-532-139 SLPA-CLINICAL PROCEDURES** ...universal precautions, communicative competence, teamwork, speech and language screening, SLPA supervision and documentation, copyright laws, inservice and public relations preparation, administrative duties, and fieldwork preparation. (Prerequisites: 10-532-123, SLPA-Speech/Language Development; 10-532-124, SLPA-Aural Rehabilitation)

**10-532-140 SLPA-TREATMENT LAB** ... universal precautions training/skills check-off, speech disorders treatment/skill training check-off, language disorder skill training/check-off, Speechviewer III software training/check-off, software training, check-off, and audiovisual. (Corequisite: 10-532-137, SLPA-Speech Disorders/Treatment; 10-532-138, SLPA Language Disorders/Treatment)

**10-532-145 SLPA-ETHICAL DECISION-MAKING** ...values, elements of ethics, ethical problems, ethical situations, six-step process of ethical decision-making and application of skills through case study analysis. (Prerequisite: 10-532-139, SLPA-Clinical Procedures; Corequisite: 10-532-146, SLPA Fieldwork)

**10-532-146 SLPA-FIELDWORK** ...oral/written communication skills, interpersonal skills, time management, technology, speech-language-hearing screenings, treatment plans, treatment materials, behavior management, document client performance, assist SLP, department operations, maintain equipment and materials. (Prerequisites: 10-532-131, SLPA Clinic; 10-532-140, SLPA Treatment Lab)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Supervisory Management Program Code 101961

## ASSOCIATE DEGREE - ACCELERATED AND FLEXIBLE LEARNING OPTIONS

Offered at the Green Bay, Marinette, and Sturgeon Bay campuses. Information in Green Bay: (920) 498-5444. Information in Marinette: (715) 735-9361. Information in Sturgeon Bay: (920) 743-2207. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Supervisory Management 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 a flexible, part-time schedule with most hours arranged to accommodate working adults. A student may complete portions of the program through credit by examination, credit for work experience, TV home study courses, online courses, and transfer of credit from other accredited institutions. Courses may also be taken on a fulltime schedule. The occupation specific courses have classroom contact hours reduced but they deliver equivalent knowledge and skills.

Graduates of this program will be able to:

- Practice ethical leadership.
- Perform in team environments.
- Value diversity.
- Demonstrate workplace communication skills.
- Demonstrate analytical/creative thinking.
- Understand the financial components of an organization.
- Exhibit leadership skills.
- Demonstrate project management skills.
- Demonstrate professionalism in management of time stress.
- Adapt organizations for change.
- Apply continuous improvement processes.
- Affect workplace safety.
- Apply current legal workplace standards.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see Accuplacer section of this catalog for more information.

- Basic reading and writing skills
- Math and reading assessments
- Completion of all recommended activities to address math and reading skill deficiencies

It is recommended that a student have a minimum of two years work experience and basic computer skills prior to entering the Supervisory Management Program.

### MATH LEVEL

Students should have mastered basic math skills. For a description of basic math, see the Basic Education section of this catalog.

### EMPLOYMENT POTENTIAL

This program is designed to attract persons who are already engaged in, or are preparing for, supervisory or leadership roles in an organization. An employee who is already in a supervisory, 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, who has established a good working relationship with his/her present employer, will enhance leadership skills and increase the chance of promotion into a leadership role as an opportunity presents itself within the company.

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 supervisory skills and practices, today's leaders must understand system(s), variation, and the Quality Improvement Process; be resources rather than bosses; effectively manage work place diversity; display leadership skills; use critical thinking skills; and use communication skills appropriate to the new team environment.

**Students may take 12-15 credits per semester and complete the degree in 2 to 2 1/2 years.**

**NOTE:** The 11 occupational specific courses, those beginning with a course number 196-xxx, are delivered in an Accelerated Learning format, specifically intended for working adults. These courses have a compressed schedule of six weeks each. Students may complete three courses totaling nine credits in the same time that one traditional three-credit course is completed.

### CURRICULUM

The Supervisory Management Associate Degree consists of 11 occupational specific courses (each course is six weeks in length) and 11 occupational support and general education courses. Upon graduation, a student will have completed 66 credits.

Course No.	Description	Credits
10-196-134	Legal Issues-Supervisors	3
10-196-136	Safety-Workplace	3
10-196-164	Supervisors-Personal Skills	3
10-196-168	Organizational Development	3
10-196-169	Diversity/Change Management	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
<b>TOTAL CREDITS</b>		<b>33</b>

Individuals may select the following accelerated or traditional occupational support and general education courses in any sequence while attending accelerated occupational specific courses.

These course requirements can also be met through credit for work experience, TV home study courses, and transfer of credit from other accredited institutions.

Course No.	Description	Credits
10-101-184	Business Finance/Budgeting	3
10-102-182	Business Operations	3
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-151	Micro: Power Point Introduction	1
10-801-195	Communication-Written	3
	OR	
10-801-175	English Composition 1	3
10-801-196	Oral/Interpers Communication	3
	OR	
10-801-198	Speech	3
10-804-149	Math Processes	3
10-809-195	Economics	3
10-809-197	Society-Amer Contemp	3
	OR	
10-809-196	Sociology-Intro	3
10-809-199	Psychology-Human Rel	3
	OR	
10-809-198	Psychology-Intro	3
	Elective	3
	Elective	3
<b>TOTAL CREDITS</b>		<b>33</b>

**SUGGESTED ELECTIVE:** Ethics (10-196-199)

**ONLINE e-LEARNING OPTIONS:** Visit NWTC's Web site at [www.nwtc.edu](http://www.nwtc.edu) to view options for Supervisory Management courses and related certificates delivered via the Web.

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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.

**10-196-134 LEGAL ISSUES-SUPERVISORS** ...legal practices in both union and nonunion environments, impact of US employment laws, global economy, appeal process, legal charges, hiring and firing process, harassment issues, and privacy issues.

**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.

**10-196-164 SUPERVISORS-PERSONAL SKILLS** ...time management, stress, and related challenges to a supervisor, personal planning, valuing rights and responsibilities of others, effective communication, and assertiveness.

**10-196-168 ORGANIZATIONAL DEVELOPMENT** ...develop more effective organizations through diagnosis, planning, interventions, and improvement via continuous learning about structure, processes, resources, culture, and change in a global environment.

**10-196-169 DIVERSITY/CHANGE MANAGEMENT** ...diversity in the workplace, analyze the effect of perceptions, attitudes, biases, and organization culture on diversity, dealing with barriers, change management strategy, process, and reactions, 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, 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, mission and goals, ethical behavior, leadership style and adaptation, impacts of power, employee development, coaching, managing change, and conflict resolution.

**10-196-191 SUPERVISION** ...application of strategies and transition to a contemporary supervisory role including day-to-day operations, analysis, delegation, controlling, staffing, leadership, problem solving, team skills, motivation, and training.

**10-196-192 MANAGING-QUALITY** ...personal philosophy of quality, identifying all stakeholder relationships, meeting/exceeding customer expectations, managing a quality improvement project, and measuring effectiveness of continuous improvement activities.

**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.

Descriptions of courses not found on this page can be found in the back of the catalog.

# Supply Chain Management

Program Code 101821

(Formerly Logistics, Materials Management, Transportation/Distribution)

## ASSOCIATE DEGREE - TWO YEARS

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### 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, purchasing, international trade, customer service, and logistics management.

Graduates of this program will be able to:

- Compare major transportation modes.
- Respond appropriately to requests for transportation services.
- Perform inventory control.
- Demonstrate familiarity with global trade processes.
- Develop a global business perspective.
- Plan a product using a manufacturing resource planning process.
- Perform supplier selection and evaluation.
- Demonstrate negotiation skills.
- Track commodity market trends.
- Perform logistical mathematical calculations.
- Apply legal and ethical standards pertaining to logistics.
- Monitor service, quality, and cost performance.
- Demonstrate knowledge of the application of supply chain concepts.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see Accuplacer section of this catalog for more information.

- Basic math
- Ability to use computer keyboard

### MATH LEVEL

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 in the program will have the potential for employment as a Buyer/Planner, Claims Analyst, Customer Service Representative, Dispatcher, Inventory Analyst, Inventory Control Specialist, Logistics Technician, Materials Planner, Master Production Scheduler, Purchasing Assistant, Shipping and Receiving Specialist, Transportation Planner Coordinator and Warehouse Specialist.

**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, leadtime, 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 66 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
10-103-121	Micro: Word-Introduction	1
10-103-131	Micro: Excel-Introduction	1
10-103-141	Micro: Access-Intro	1
	OR	
10-103-151	Micro: Power Point	1
10-138-150	Global Business-Fund	3
10-182-110	Materials/Operations Mgmt	3
10-182-157	Logistics/Supply Chain Mgmt	3
10-804-101	Math-Business	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

#### SECOND SEMESTER

10-101-141	Accounting-Financial	3
10-104-191	Customer Service Mgmt	3
10-182-109	Transportation-Intro	3
10-182-120	Enterprise Resource Plan/Cont	3
10-182-127	Purchasing	3
10-801-195	Communication-Written	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

#### THIRD SEMESTER

10-104-110	Marketing Principles	3
10-182-116	Transportation Admin	3
10-801-196	Oral/Interpersonal Comm	3
10-809-195	Economics	3
10-809-199	Psychology-Human Rel	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>18</b>

#### FOURTH SEMESTER

10-138-160	Global Supply Chain	3
10-182-130	E-Comm Logistics/Fulfill	3
10-182-141	Logistics Internship	3
10-809-197	Society-Amer Contemp	3
	Elective	3
	<b>SEMESTER TOTAL</b>	<b>15</b>

**SUGGESTED ELECTIVES:** International Business Practice (10-102-104), Negotiations (10-182-131), Motor Carrier-Commercial (10-182-166)

This program is fully eligible for financial aid.

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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.

### **10-104-191 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.

### **10-138-150 GLOBAL BUSINESS FUNDAMENTALS**

...foundations of global business, global business environment, organize for global business, manage global business, marketing in a global economy, and global financial management.

### **10-138-160 GLOBAL SUPPLY CHAIN**

...international logistics, documentation, harmonized codes, payment methods, export management, global sourcing, international legal considerations and international trade agreements.

### **10-182-109 TRANSPORTATION-INTRODUCTION**

...framework, role, and historical development of transportation; characteristics of railroad, truck, and air transportation; and the pipeline industry.

### **10-182-110 MATERIALS/OPERATIONS**

**MANAGEMENT** ...operations strategies, materials planning, manufacturing processes, demand forecasting, inventory fundamentals and location decisions.

### **10-182-116 TRANSPORTATION**

**ADMINISTRATION** ...fundamentals of the administrative aspects of transportation operation; hands-on exercises in freight classification, tariffs, carrier pricing schedules, rates, bills of lading, contracts, and freight claims.

### **10-182-120 ENTERPRISE RESOURCE PLAN/**

**CONTROL** ...concepts, strategies, methodologies, and tools necessary for successful ERP implementation; strategic organizational considerations for ERP functions such as project management, scope definition, and project planning; technical alternative for ERP.

**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-COMMERCE LOGISTICS/**

**FULFILLMENT** ...e-commerce, business-to-business e-commerce, consumer e-commerce, e-commerce distribution, e-procurement, e-commerce connection, legal and ethical issues, and e-commerce logistics applications.

**10-182-141 LOGISTICS INTERNSHIP** ...training and experience through work experience and observation.

### **10-182-157 LOGISTICS/SUPPLY CHAIN**

**MANAGEMENT** ...supply chain management, purchasing, integrated logistics, customer service, service response logistics, domestic transportation, traffic management, inventory management, warehouse management, materials handling/packaging, reverse logistics, international logistics.

# Surgical Technologist

Program Code 315121

## TECHNICAL DIPLOMA - 3 SEMESTER PROGRAM: ENTER IN SUMMER OR FALL

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5543. Toll free: (800) 422-NWTC.

### 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.

Graduates of the Surgical Technologist program will be able to:

- Be successfully employed in the field.
- Function as a member of the surgical team.
- Apply and maintain the principles of sterile technique and safety in the operating room.
- Prepare, handle, and care for surgical instruments, supplies, equipment, and medication.
- Use medical terminology.
- Identify basic anatomy and physiology.
- Maintain CPR certification.
- Operate a personal computer.
- Communicate effectively.
- Recognize the legal and policy limits of individual responsibility.
- Pass the Certification Test.

### REQUIREMENTS FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent.
- Satisfactory placement in the NWTC mathematics and reading tests or satisfactory placement on the ACT assessment test.
- An interview or orientation.
- A satisfactory medical examination within three months before entering the program.

All students are required to complete an American Heart Association Health Care Provider CPR course prior to program entry. Students are required to maintain a current CPR card on a one-year renewal cycle to comply with affiliating agency requirements.

### MATH LEVEL

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 this program will have the potential for employment as a Surgical Technologist, Central Supply Technician, Claims Approver, or Private Scrub Technician.

**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 and supplies for operative procedures.

**CENTRAL SUPPLY TECHNICIAN:** performs general cleaning of soiled equipment and instruments, assembles procedure trays and instrument pans, maintains inventories, operates sterilizer, records patient charges, and does general record keeping.

**CLAIMS APPROVER:** processes insurance claims on a computer terminal.

**PRIVATE SCRUB TECHNOLOGIST:** is hired by the physician and assists as a surgical technologist in a hospital or in a private practice.

Wisconsin's Caregiver Law (1997 WISCONSIN ACT 27) requires a completed criminal background check prior to access to patients and/or children in clinical agencies/field sites used by this program. Based upon results of the criminal background check, a student may be denied access to clinical agencies/field sites and thus would not be able to complete the program. For the most current information on the Caregiver Law, visit this Web site: [www.dhfs.state.wi.us](http://www.dhfs.state.wi.us).

Students will be required to purchase their own scrub suits, provide their own transportation to clinical facilities, and pay for liability insurance for each clinical course.

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

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Englewood, CO 80112  
(303) 694-9262  
FAX (303) 689-0518

### CURRICULUM

The Surgical Technologist Technical Diploma is a three-semester program. Upon graduation, a student will have completed 31 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
* 10-501-101	Medical Terminology	3
31-801-385	Communicating-Writing	1
31-801-386	Communicating Effectively	1
* 31-806-312	Anatomy/Struct-Funct	2
<b>SEMESTER TOTAL</b>		<b>7</b>

#### SECOND SEMESTER

10-103-121	Micro: Word-Introduction	1
* 31-512-301	Surgical Tech Proc Lab A	4
* 31-512-302	Surg Tech Proc Lab B	4
* 31-512-313	Surgical Tech Clinical 1	3
* 31-512-316	Surgical Tech Skills	1
<b>SEMESTER TOTAL</b>		<b>13</b>

#### THIRD SEMESTER

* 31-512-323	Surgical Tech Clinical 2	4
* 31-512-324	Surgical Tech Proc-Adv	3
* 31-512-333	Surgical Tech Clinical 3	4
<b>SEMESTER TOTAL</b>		<b>11</b>

**NOTE:** A student must be accepted into the Surgical Technologist program before enrolling in 31-512-301, Surgical Tech Proc/Lab A.

A minimum of a C grade is required for all courses marked with an asterisk.

This program is fully eligible for financial aid.

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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.

**10-501-101 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.

**31-512-301 SURGICAL TECHNOLOGIST PROCEDURES/LABORATORY A** ...hospital environment, surgical team, asepsis, ethical and legal responsibilities, microbiology, infection control, sterilization, anesthesia, positioning patients, draping, specimen care, scrub and circulating duties. (Prerequisite: 31-806-312, Anatomy/Structure Function; Corequisite: 31-512-302, Surgical Tech Proc/Lab B)

**31-512-302 SURGICAL TECHNOLOGIST PROCEDURES/LABORATORY B** ...continuation of hospital environment, surgical team, asepsis, ethical and legal responsibilities, microbiology, infection control, sterilization, anesthesia, positioning patients, draping, specimen care, scrub and circulating duties. (Prerequisite: 31-806-312, Anatomy/Structure Function; Corequisite: 31-512-301, Surgical Tech Proc/Lab A)

**31-512-313 SURGICAL TECH CLINICAL 1** ...introduction to the operating room environment, identification and proper handling of surgical instrumentation, demonstration of scrubbing and circulating duties, body substance isolation, and utilization of the sterilization process. (Prerequisites: 10-501-101, Medical Terminology; 31-801-385, Communicating-Writing; 31-801-386, Communicating-Effectively; Corequisites: 31-512-301, Surgical Tech Proc Lab A; 31-512-302, Surgical Tech Proc Lab B; 31-512-316, Surg Tech Skills)

**31-512-316 SURGICAL TECHNOLOGIST SKILLS** ...draping skills, Mayo stand and/or back table set-ups, routine surgical medications, specialized equipment and supplies utilized during surgery. (Prerequisites: 31-512-301, Surgical Tech Proc Lab A; 31-512-302, Surgical Tech Proc Lab B)

**31-512-323 SURGICAL TECH CLINICAL 2** ...supervised application of intermediate level skills of a surgical technologist on minor procedures and beginning level skills on major procedures. (Prerequisite: 31-512-313, Surgical Tech Clinical 1; Corequisites: 31-512-324, Surgical Tech Procedures-Adv; 31-512-333, Surgical Tech Clinical 3)

**31-512-324 SURGICAL TECHNOLOGIST PROCEDURES-ADVANCED** ...in-depth coverage of surgical procedures incorporating anatomy, terminology, instruments, medications, specialized equipment, and supplies utilized, as well as patient perioperative care. (Prerequisite: 31-512-313, Surgical Tech Clinical 1)

**31-512-333 SURGICAL TECH CLINICAL 3** ...supervised application of advanced skills of an entry-level surgical technologist demonstrated on minor and major surgical procedures, the second scrub role will also be assumed. (Prerequisite: 31-512-323, Surgical Tech Clinical 2; Corequisite: 31-512-324 Surgical Tech Proc-Adv)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Welding

Program Code 314421

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Marinette and Green Bay campuses. Information in Marinette: (715) 735-9361. Information in Green Bay: (920) 498-5444.

Toll free: (800) 422-NWTC.

### 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.

Graduates of the Welding Program will be able to:

- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent. (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

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 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 A.W.S. (American Welding Society) and A.S.M.E. (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

### CURRICULUM

The Welding Technical Diploma is a one-year, two-semester program. Upon graduation, students will have completed 35 credits.

#### FIRST SEMESTER

Course No.	Description	Credits
31-442-301	Welding-Cutting/Visual	1
31-442-313	Blueprint Reading	2
31-442-314	Welding-Layout	3
31-442-316	Welding-Shielded Metal Arc	5
31-442-317	Welding-Gas Metal Arc	5
31-804-301	Math 1-Trades	2
<b>SEMESTER TOTAL</b>		<b>18</b>

#### SECOND SEMESTER

31-422-310	Metallurgy	2
31-442-321	Welding-Gas Tungsten Arc	5
31-442-324	Metal Fabrication	4
31-442-327	Welding-Flux Core	5
31-801-386	Communicating Effectively	1
<b>SEMESTER TOTAL</b>		<b>17</b>

This program is fully eligible for financial aid.

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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.

**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.

**31-442-313 BLUEPRINT READING** ...orthographic projection, sketching, dimensioning, section and auxillary views, structural shape identification, weld symbols, welding symbol nomenclature welded joint geometry, metric conversion and interpretation of fabrication from prints.

**31-442-314 WELDING-LAYOUT** ...use measuring instruments; geometric nomenclature; elemental, circular and polygon construction; parallel line, radial line, triangulation and development of drawings to scale. (Corequisite: 31-442-313, Blueprint Reading)

**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)

**31-442-324 METAL FABRICATION** ...metal fabrication, hazards, production, measuring tools, metal shear, forming roll, pressbrakes, box and pan brake, sawing equipment, drill press, sheet metal tools, the hydraulic ironworker, and layout of shapes. (Corequisites: 31-442-313, Blueprint Reading; 31-442-314, Welding-Layout)

**31-442-327 WELDING-FLUX CORE**...safety, equipment, accessories, inspection and repairs, weld types and joint nomenclature, surface welds and all positio fillet and groove welds. (Corequisite: 31-442-301, Welding-Cutting/Visual)

Descriptions of courses not found on this page can be found in the back of the catalog.

# Wood Technics

Program Code 314102

## TECHNICAL DIPLOMA - ONE YEAR

Offered at the Green Bay campus. Admissions, registration, or counselor: (920) 498-5444. Course information: (920) 498-5461. Toll free: (800) 422-NWTC.

### PROGRAM DESCRIPTION

Wood Technics prepares students to enter the building construction trades as carpenters and cabinetmakers.

Graduates of the Wood Technics Program will be able to:

- 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.

### REQUIREMENT FOR PROGRAM ENTRY

NWTC requires an entrance skill inventory for all program students. Please see the Accuplacer section of this catalog for more information.

- High school diploma or equivalent (Equivalency may be established through GED testing or other tests.)

### MATH LEVEL

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: Carpenter/Cabinetmaker, Carpenter/Finish, Carpenter/General Builder, Carpenter/Mill Worker and Carpenter/Rough.

**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 Journey person
- Mill Supervisor
- Journey level Cabinet Maker

### CURRICULUM

The Wood Technics Technical Diploma is a one-year, two-semester program. Upon graduation, a student will have completed 34 credits.

**NOTE: MATH 1 TRADES MUST BE TAKEN DURING THE FIRST SEMESTER AT NWTC.**

#### FIRST SEMESTER

Course No.	Description	Credits
31-804-301	Math 1-Trades or Math 2 Track	2
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>18</b>

#### SECOND SEMESTER

31-804-302	Math 2-Trades or Math 2 Track	1
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>16</b>

This program is fully eligible for financial aid.

## 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. (Prerequisite: 31-409-321, Wood Techniques-Cabinetry 1)

### 31-410-301 WOODTECHNICS-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. (Prerequisite: 31-410-311, Wood Techniques-Carpentry 1)



Descriptions of courses not found on this page can be found in the back of the catalog.