

CAREER TECHNICAL EDUCATION



Explore Hands on

- Skilled Trades
- High Tech
- Business
- Health Care

nmu.edu/cte
maresacte.org

FIFTY HOT JOBS



OUTLOOK THROUGH 2020

From the Michigan Department of Technology, Management and Budget,
Bureau of Labor Market Information & Strategic Initiatives and O*Net.

Michigan's High Demand Occupations	Median Hourly Wage	Job Growth MI	Job Growth U.P.	Michigan's High Demand Occupations	Median Hourly Wage	Job Growth MI	Job Growth U.P.
Business and Information Technology Fields				Industrial Machinery Mechanics			
Accountants and Auditors	\$29.67	11.6%	4.6%	Machinists	\$18.39	16.6%	26.3%
Computer and Information Systems Managers	\$49.71	11.7%	15.8%	Mechanical Engineering Technicians	\$27.09	14.8%	7.6%
Computer Numerically Controlled Machine Tool Programmers	\$22.78	37.9%	43.6%	Mechanical Engineers	\$42.67	12.5%	20.6%
Computer Systems Analysts	\$38.46	22.6%	16.3%	Millwrights	\$31.16	16.4%	
Computer User Support Specialists	\$21.59	18.5%		Operating Engineers and Other Construction Equipment Operators	\$21.85	14.5%	10.4%
Financial Analysts	\$34.86	11.9%		Plumbers, Pipefitters, and Steamfitters	\$28.21	15.0%	
Financial Managers	\$47.76	8.3%		Health Care Fields			
General and Operations Managers	\$43.67	10.5%	1.9%	Dental Hygienists	\$29.10	18.1%	4.0%
Insurance Sales Agents	\$21.60	13.7%		Diagnostic Medical Sonographers	\$28.58	32.6%	25%
Logisticians	\$37.91	20.6%		Healthcare Social Workers	\$24.56	16.6%	18.4%
Management Analysts	\$36.73	12.9%	8.4%	Licensed Practical and Licensed Vocational Nurses	\$21.27	14.8%	8.1%
Market Research Analysts and Marketing Specialists	\$26.87	29.2%	18.5%	Medical and Health Services Managers	\$41.10	13.0%	
Operations Research Analysts	\$39.48	28.1%		Nurse Practitioners	\$43.88	19.7%	
Personal Financial Advisors	\$30.19	25.8%		Occupational Therapists	\$32.99	18.1%	
Software Developers, Applications	\$37.74	21.3%	11.7%	Physical Therapist Assistants	\$21.03	26.1%	14.5%
Software Developers, Systems Software	\$41.96	19.6%	33.7%	Physical Therapists	\$38.28	22.7%	13.8%
Skilled Trades				Physician Assistants	\$45.42	24.0%	
Carpenters	\$20.24	16.7%	8.4%	Physicians and Surgeons, All Other	\$86.17	11.3%	
Civil Engineers	\$33.37	18.3%		Registered Nurses	\$31.47	11.4%	11.8%
Construction Managers	\$39.71	13.1%	7.4%	Other Fields			
Cost Estimators	\$27.46	19.5%	24.3%	Architects	\$34.74	17.1%	
Electrical Engineers	\$40.77	11.4%		Architectural and Engineering Managers	\$56.00	12.4%	
Electricians	\$28.07	13.3%		Education Administrators, Postsecondary	\$44.73	13.0%	
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$21.46	17.2%	20.4%	Lawyers	\$45.92	7.7%	
Heavy and Tractor-Trailer Truck Drivers	\$18.05	14.3%	6.2%	Social and Community Service Managers	\$29.08	16.9%	
Industrial Engineers	\$37.96	14.9%	21.7%	Veterinarians	\$43.71	15.6%	

*Career Training featured in this magazine

The Career Technical Education Committee of Marquette & Alger Counties

The CTE Committee was established in October 2013 with the intent of supporting both secondary and postsecondary vocational programs and providing the skilled workforce needed to sustain and grow our regional economy. The committee has grown to 26 members representing 22 organizations devoted to workforce development. Uniting these likeminded but diverse organizations has strengthened initiatives and provided many new opportunities for students. Committee members represent the organizations illustrated below.

Thank you for supporting this magazine

Northern Michigan University
 Marquette Alger Regional Education Service Agency
 Lake Superior Community Partnership Foundation
 UP Construction Council
 UP Collaborative Development Council
 Michigan Forest Products Council



Please visit, "Like" and "Share" our Facebook page:
<https://www.facebook.com/ctemarquettealger>

Committee Successes:

- ▶ Conducted over 50 face-to-face meetings with government officials
- ▶ Presented at the 2014 Governor's Economic Summit in Grand Rapids
- ▶ Participated in the Michigan Merit Curriculum Flexibility Bill Signing 2014
- ▶ 12-page publication 2015
- ▶ 36-page publication 2016
- ▶ Expansion of Geometry In Construction across the U.P. and state
- ▶ Establishment and expansion of the Marquette-Alger Technical Middle College
- ▶ LinkedIn Group includes 440 members
- ▶ Facebook Page has reached over 12,000 people and has over 600 likes

Committee Goals:

1. Increase and Improve CTE opportunities
2. Expand our role in publicizing CTE programs
3. Promote the use of hands-on teaching methods
4. Help increase the number of school counselors
5. Help develop public/private partnerships
6. Help develop and expand the Marquette-Alger Technical Middle College
7. Increase internships and job shadowing programs
8. Identify and reduce barriers to work-based learning opportunities
9. Help establish a Middle School Career Day that focuses on the skilled trades

A special CTE publication showcasing the opportunities for high school students to start training today for some of the country's fastest growing, high paying careers.

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Business, Finance,

HIGH SCHOOL PROGRAMS:

Marquette and Alger County high schools provide a robust selection of business, finance and information technology programs, both at the micro and macro levels of business education. With the programs' emphasis on both technical and employability skills, students who enroll in these classes will be well prepared for the rigors of similar college programs and careers in business.

Business, finance and information technology programs at Gwinn, INN Community Schools, Ishpeming, Marquette, Munising, Negaunee and Westwood High Schools offer a vast array of courses focused on developing skills in communication, leadership, management, self-awareness and problem solving.

BUSINESS PROGRAMS feature business simulations and real-world applications and cover everything from business basics and being a savvy consumer to the development of actual entrepreneurial business plans.

FINANCE PROGRAMS range from personal finance and money management to corporate accounting with an emphasis on the use of the technology and computerized accounting to analyze financial data.

INFORMATION TECHNOLOGY courses expose students to everything from basic word processing, Microsoft Office applications and Google Apps to advanced web design, interactive graphics and media production.

Business, finance and information technology courses should be part of the curriculum for every high school student, helping young adults manage their own financial affairs and make intelligent consumer and business-related choices in the global marketplace.



BPA:

Students at Westwood High School also have the opportunity to participate in Business Professionals of America (BPA), which allows students to test their skills in regional, state and national business competitions, where they have excelled, including first-place wins in Legal Office Procedures.

“So far in Westwood’s CTE business program, I’ve taken Business and Technology as well as Information Management. In those classes I’ve learned word processing skills, investment techniques and Adobe CS6 Illustrator and Photoshop. I plan to stick with the business program in my future at WHS and to prepare me for life.”

KYLE SWIEDALS, WHS CLASS OF 2018

Information Tech



Upper Michigan's Source

Negaunee's Hour of Code

Each year, Negaunee High School teacher Beth Holmgren and her students bring the Hour of Code to other students throughout their district. Organized by the nonprofit Code.org, the event serves to highlight the importance of computer science as a critical skill for 21st century success. 125 Negaunee High School computer students participated last year. During five days, more than 1,400 students from the entire Negaunee district joined the fun. After much work creating lesson plans and preparing materials, NHS students taught an Hour of Code to all high school and elementary classes, and more than half of the middle school students, not only introducing them to computer coding and its many applications, but serving as positive role models as well.

In one week, 15 million students around the world try computer science.



"My experiences in CTE business classes at Westwood prepared me for college and beyond. I have learned to use different programs including Microsoft Office and Adobe CS6. My accounting classes have prepared me for my career goal of being a Certified Public Accountant."

RACHEL ANDERSON,
WHS CLASS OF 2015, NMU CLASS OF 2019

"I plan to go into business so I need these courses. I've taken Information Management, Economics Online, Business Law, Entrepreneurship, Management and Leadership, Business and Management and Accounting. Each has given me tools to use for my future."

MARQUISE BAGGIORE,
WHS CLASS OF 2015,
UNLV CLASS OF 2019

TECH-READY

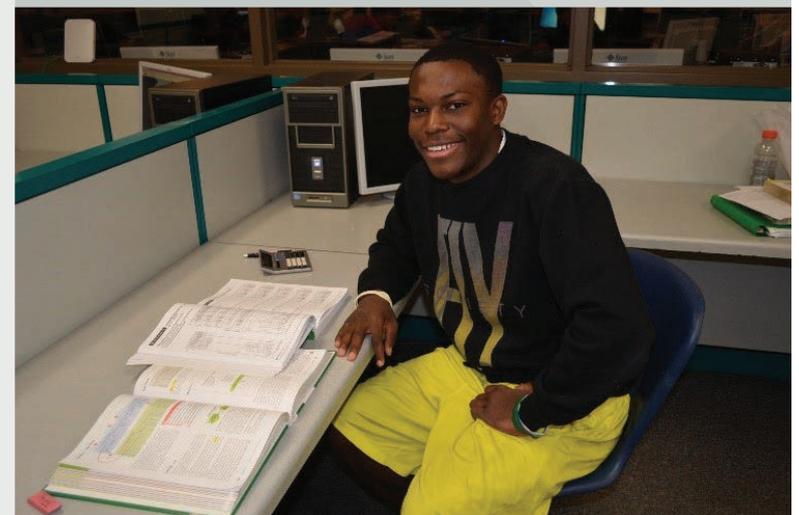
The Westwood High School CTE Business program has continually offered its students the most up-to-date, industry-standard applications such as Adobe Photoshop and Maxon Cinema 4D.

Students work in project teams to perform a variety of jobs, many of which generate revenue that funds other projects. For instance, students work together to sell advertisements in the school's sports calendar, create the ads in Photoshop and then design the sports calendar for distribution to businesses throughout the community.

Students also develop and design a money saver card that is sold by Business Professionals of America students as a fundraiser to attend competitions.

Westwood High School is also a Microsoft Authorized Testing Center. Students work hard to pass industry level certification in Word, PowerPoint, Excel and Access. So far this school year, Westwood students have passed over 85 of these tests, including three students who have passed the master certification.

Students leave the classroom with the skills needed to succeed not only in college, but in business today.



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Business

THE COLLEGE OF BUSINESS AT NMU:

Do you dream of creating amazing ads for companies like Puma or Ford? Maybe you'd rather start your own business. Or enjoy the perks of working at Google. Are numbers your game and a gig with a major accounting firm your goal? In NMU's wide range of business programs, you can even get a degree to manage a ski hill.

Whatever you want to do, you will be challenged, inspired and supported by your professors in Northern's College of Business. Plus you will not only get prepared for the real world, you'll be involved in helping actual businesses, investing in the stock market, hacking computer systems in order to fight the bad guys, and so much more. The college's excellence is indicated by accreditation from the Association to Advance Collegiate Schools of Business—granted to only the best business schools in the world.

NMU BUSINESS, FINANCE & IT PROGRAMS:

Certificate (1 year)
Office Services

Associate degrees (2 years)
Information Systems (coming soon)
Insurance and Risk Management (coming soon)
General Business
Health Information
Office Information Assistant

Bachelor's degrees (4 years)
Accounting
Accounting/Computer Information
Accounting/Corporate Finance
Information Assurance/Cyber Defense
Information Systems
Entrepreneurship
Finance and Risk Management
Management
Marketing
Ski Area Business Management

Master's degree
Business Administration (MBA)

Minors
Accounting
Business Administration
Computer Information Systems
Entrepreneurship
Finance
Management
Marketing
Office Services



★ ENTREPRENEURSHIP CONFERENCE:

NFL star Tim Shaw, who played for the Chicago Bears, Jacksonville Jaguars, Carolina Panthers and Tennessee Titans and is currently an entrepreneur, was the featured speaker at the 2015 Celebration of Entrepreneurship. The event offered business development workshops from a wide range of experts and the New Business Venture Competition—both welcoming high school and college students.

Shaw is pictured with Dr. Dave Rayome, dean of the NMU College of Business.

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Business

Accounting & Finance

JOB SPOTLIGHT - Accountant or Auditor

Median Earnings



\$32/hr.

(earnings range: \$20 - \$56/hr.)

Earnings, job growth and education levels noted in this publication are from Economic Modeling Specialists Intl. (EMSI) and the Occupational Information Network (O*NET).

Projected Job Growth to 2024



+ 11% (National)
+12% (Michigan)

Education levels of current workers



4% high school diploma
8% some college
10% associate degree
52% bachelor's degree
19% master's degree

CAREER PATH

College: bachelor's degree or minor
Apprentice Programs: None
High School: Finance CTE classes

ABOUT THE CAREER:

Accounting careers have been staples in our economy. Even when markets have slowed over the years, accountants have remained in high demand. A business degree in accounting from NMU provides competency in the functional areas of accounting and provides students with the requirements to sit for professional examinations such as the CPA and CMA examinations. Depending on whether the accounting major or accounting with specializations in computer information systems or corporate finance is chosen, students are prepared for careers such as certified public accountant (CPA), cost analyst, controller, financial analyst, senior accountant, vice president for finance and accounting, director of information systems, computer programmer or systems analyst.

WHAT YOU'LL LEARN AND DO AT NMU:

The **finance and risk management major** at Northern provides students with competency in the functional areas of finance, the education foundation that is needed to prepare them for professional exams such as the Series 7, CFP and CFA. In addition to being an actuary, this program leads to careers in business financial management, banking, securities and commodity brokerage, consulting, insurance, financial planning and small business entrepreneurship.

Special Opportunities:

- Wall Street-type Trading Lab on campus
- Student Managed Investment Fund
- Industry panel discussion/recruiting event
- Beta Alpha Psi accounting club and travel to metropolitan accounting firms



PROFILE

"I like that my major has offered many opportunities for me to have real-world experience. Professors have been active and caring in my experience at NMU. I receive many emails that contain opportunities for internships, clubs, volunteer opportunities, etc.

I have been able to tutor students and help those who struggle in subjects that I have excelled in. I also have been able to network with professors who have been and are connected to resources within the accounting/technology realm."

DANIELLE LACOUNT, AN ACCOUNTING/CIS MAJOR FROM PULASKI, WISCONSIN

JOB SPOTLIGHT: Actuary

Actuaries analyze the financial costs of risk and uncertainty. They use mathematics, statistics and financial theory to assess the risk that an event will occur, and they help businesses and clients develop policies that minimize the cost of that risk. Actuaries' work is essential to the insurance industry.

Median Earnings



\$46/hr.

Projected Job Growth to 2024



18% (National)

Business

High Tech Information Systems

JOB SPOTLIGHT - Security Analyst

Median Earnings



\$43/hr.

(earnings range: \$21 - \$60/hr.)

Earnings, job growth and education levels noted in this publication are from Economic Modeling Specialists Intl. (EMSI) and the Occupational Information Network (O*NET).

Projected Job Growth to 2024



+ 18% (National)
+30% (Michigan)

Education levels of current workers



6% high school diploma
22% some college
14% associate degree
34% bachelor's degree
21% master's degree

CAREER PATH

College: associate, minor, bachelor's, master's degree
Apprentice Programs: None
High School: Information Technology CTE classes

ABOUT THE CAREER:

Information security analysts plan and carry out security measures to protect an organization's computer networks and systems. Their responsibilities are continually expanding as the number of cyber attacks increases. Most information security analysts work for computer companies, consulting firms or business and financial companies.

WHAT YOU'LL LEARN AND DO AT NMU:

You don't need to be a computer genius to succeed in the world of cyber security - you just need to be adventurous, curious and willing to learn. In Northern's **information assurance/cyber defense major**, you will combine courses in business, computer information systems and cyber security to form the wide-reaching skills necessary for this exciting and rapidly expanding field.

You will learn about accounting practices, business and cyber law, networks and security, UNIX administration, and choose from classes in e-commerce, digital and network forensics and mobile applications. You'll also participate in a hands-on project or internship that will provide valuable real-world experience.

Cyber Defense Lab:

Northern's 24-seat cyber defense laboratory is equipped with the latest networking equipment and the same software used by security professionals. Students learn real-world computer networking, ethical hacking, and defensive security techniques, and how to think like a hacker in order to protect against them.



"My internship with IBM has been one of the most rewarding things I have done during my time at NMU. The internship has given me real-world opportunities to use my skills and build my portfolio. I have had the opportunity to work with several managers within IBM's security team, which has exposed me to different leadership styles and allowed me to take part in numerous unique projects. I was also part of a project aimed at introducing real-world technologies from IBM into the classroom.

I may never have even found out about this amazing opportunity had it not been for one of my professors urging me to apply."

AMY ROELL, A CYBER DEFENSE MAJOR FROM RANDVILLE, MICHIGAN

PROFILE

JOB SPOTLIGHT: IT Manager

Information Systems Managers plan, coordinate and direct computer-related activities in an organization. In NMU's **business computer information systems major**, students select an area of emphasis from end-user training, Web development or networking administration.

Median Earnings



\$61/hr.

Projected Job Growth to 2024



15% (National)

Business

Management & Marketing

JOB SPOTLIGHT - Human Resources Manager

Median Earnings



\$49/hr.

(earnings range: \$29 - \$88/hr.)

Earnings, job growth and education levels noted in this publication are from Economic Modeling Specialists Intl. (EMSI) and the Occupational Information Network (O*NET).

Projected Job Growth to 2024



+ 9% (National)
+13% (Michigan)

Education levels of current workers



12% high school diploma
21% some college
8% associate degree
36% bachelor's degree
18% master's degree

CAREER PATH

College: bachelor's degree or MBA
Apprentice Programs: None
High School: Business CTE classes

ABOUT THE CAREER:

Human resources managers plan, direct and coordinate the administrative functions of an organization. They oversee the recruiting, interviewing and hiring of new staff; consult with top executives on strategic planning; and serve as a link between an organization's management and its employees.

WHAT YOU'LL LEARN AND DO AT NMU:

Are you interested in leading an organization, project planning or helping others work more effectively? The **management major** at Northern is designed to provide a theoretical base as well as the ability to critically apply and evaluate managerial actions and decision-making skills in complex situations.

The **entrepreneurship major** is designed for students who want to develop their own businesses. It provides a comprehensive knowledge of accounting, finance, management, marketing and computer information systems as these areas relate to entrepreneurial business. Students learn a skill set that will increase their likelihood of success in an entrepreneurial setting or even a corporate setting in need of entrepreneurial thinking. The program emphasizes learning by doing, not just by reading from a book.

NMU's **minors in entrepreneurship, management or business administration** provide an understanding of how people function in the work environment as well as the issues that may affect organizational effectiveness. This degree may lead to careers such as management consultant, quality control manager, director of planning, employee relations manager or business owner.

Special Opportunities:

- New Business Venture Competition
- Annual Entrepreneurship Conference
- Entrepreneurship & Marketing Careers and U.P. Business Careers luncheons
- Study abroad through the International Business Studies Exchange Network
- Invent@NMU
- American Marketing Association student chapter



PROFILE

"Being a College of Business student, I have had the opportunity to meet so many amazing people, attend some fantastic events, and really prepare myself for my future in the business world. I have been a part of the American Marketing Association on campus since my freshman year, and I am now the president of that group. We meet every other week and focus on marketing-related topics and work on bringing in speakers and planning events related to the field. The Dean's Student Advisory Council for the College of Business is another group I am a part of and I really like the one-on-one communication we are able to have with the dean."

TONY CARLSON, A MARKETING MAJOR FROM ISHPERING, MICHIGAN

JOB SPOTLIGHT - Marketing Manager

Advertising, Promotions or Marketing Managers plan programs to generate interest in products or services. They work with art directors, sales agents and financial staff members. They work in advertising agencies, companies or other enterprises.

Median Earnings



\$59/hr.

Projected Job Growth to 2024



9% (National)

Business



TEAM BUSINESS

Small groups of business students join together to work with local and regional businesses and organizations to help them succeed. The support may be in creating and executing a marketing plan, creating an e-commerce site, rebranding or improving production and distribution—whatever the business needs. NMU students have successfully assisted Wealth Strategy Group, All Natural Greens, Coder Dojo 906 and Invent@NMU, among others.



PROFILE

SCHOLARSHIPS

Congratulations to the Marquette-Alger students who received a total of **\$102,000** in donor-funded scholarships to attend NMU's College of Business for the 2015-16 academic year!

Gwinn High School

Shelby Talsma Yolanda M. Kline Memorial Scholarship

Marquette Senior High School

Rachel Bartlett Columbia Hansen Scholarship; Gloria and William Jackson Scholarship; Makela, Toutant, Hill and Nardi Scholarship
Cole Genschaw Sam M. Cohodas College of Business Scholarship; Makela, Toutant, Hill and Nardi Scholarship
Casey Mallo Ludlow Family Scholarship
Leah Lynn Rajala Robert S. Myefski Memorial Scholarship
Caitlin Short Gloria and William Jackson Scholarship; Stan Whitman Memorial Scholarship
Laurie Short Anne and Robert Pecotte Scholarship; Patricia A. and David E. Lahti College of Business Scholarship
Alexander Valle Sam and Evelyn Cohodas Scholarship; Patricia A. and David E. Lahti College of Business Scholarship

Munising High School

Savana Marie Lare James T. Malsack Scholarship

Negaunee High School

Jessie DeGabriele Carol E. and Thomas V. Buchl Scholarship
Wade Saari Range Bank Scholarship

Westwood High School

Anthony Carlson Sam M. Cohodas College of Business Scholarship
Daniel John Irish Peter White Student Scholarship
Gabrielle Kautz Kenneth J. and Virginia A. Bureau Scholarship

"I like that marketing can be applied to many different things within the world of business and I'm going to be able to go in a lot of directions with it.

My favorite professor so far is Dr. Steinhaus! I had her for Organizational Behavior and Management. She was always really helpful and uplifting."

GABI KAUTZ, MARKETING MAJOR FROM ISHPERING and winner of a Kenneth J. and Virginia A. Bureau Scholarship. Preference is given to U.P. residents interested in studying management and marketing.

Business

◆ COLLEGE OF BUSINESS EVENTS

February 10

Speed Interviewing

Students practice their job interviewing skills in three-minute sessions with business professionals in order to advance their career preparedness in a fun, fast-paced event.

March 30

Entrepreneurship and Marketing Careers Panel Luncheon

Learn about career opportunities and ask questions of business leaders. (Registration is required.)

March 31

New Business Venture Competition

Student finalists pitch their ideas to a panel of judges and compete for funding to assist in getting their business idea off the ground. Along with cash prizes, the winners will also receive consulting packages to help launch their business. The competition day features a trade fair display, elevator pitch competition, business plan presentations and reception.

April 7

U.P. Business Careers Event

An opportunity for local employers to meet College of Business graduating students with a desire to find employment in the U.P. (Registration is required.)

April 21

Kevat Juhla (Spring Celebration)

Supporters of the College of Business are encouraged to attend this dinner event. (Registration is required.)

April 22

Scholarship and Awards Breakfast

A celebration bringing together donors and the many College of Business students who receive valuable scholarships.



A competitor in the New Business Venture Competition receives advice from one of the judges, Terry Dehring of QuickTrophy.



PROFILE

"I like the amount of options I have with my majors. I can go a variety of different routes once I graduate. I've joined an organization for CPAs and future CPAs. It's like a community of people who aspire to be what I want to be and who also can provide support to me when times get hard.

Ever since I have come to NMU my life has been on a roller coaster of tribulations and successes. At times, I didn't know if I'd be able to continue my educational career, but NMU has welcomed me with open arms and allowed me to grow in my times of distress, and I have made an innumerable amount of life-long connections here that I know I wouldn't have found anywhere else."

JEULANI GAHJI, ENTREPRENEURSHIP AND ACCOUNTING MAJOR FROM CHICAGO, ILLINOIS

For more information on these and future events, visit nmu.edu/business/events

Middle College



WHAT IS THE MIDDLE COLLEGE?

A tuition-free, early college program that enables students from Marquette and Alger Counties to:

- Earn a high school diploma.
- Take a significant number of dual enrollment college credits at Northern Michigan University, while in high school.
- Earn a significant number of college credits toward an NMU associate degree, or a technical certificate, at no cost to the students or their families.

WHY WAS IT CREATED?

The Marquette-Alger Technical Middle College (MATMC) was established in July 2014 to:

- Create a strong incentive for students to pursue career pathways needed to sustain and grow our local economy.
- Make college an affordable option for more students and families.
- Provide a gradual, structured and supported transition from high school to college, resulting in greater college success and more residents with high-quality degrees and credentials.
- Establish a model of collaboration between high schools, colleges and local industries to produce an exceptional workforce with the academic, technical and employability skills desired by employers.

PICTURED

Front Row (left to right): Kyle Rozich, Gwinn HS; Nathan Brown, Marquette Senior HS; Alexandria Rich, Superior Central HS; Caitlin Carter, Marquette Senior HS; Hailey Lancour, Marquette Senior HS; Paige Barber, Marquette Senior HS; Nate Snyder, Marquette Senior HS; Tristen Filizetti, Westwood HS

Back Row (left to right): Derek Rogers, Negaunee HS; Nicholas Borzick, Marquette Senior HS; Micah Johnson, Negaunee HS; Gerald Herbst, Marquette Senior HS; Cameron Dyer, Marquette Senior HS; Dylan Johnson, Negaunee HS; Elek Kallioinen, Negaunee HS; Dylan Boyer, Marquette Senior HS; Zach Carter, Marquette Senior HS; Preston Marchant, Marquette Senior HS; Ryan Morrissey, Marquette Senior HS; Isaac Olson, Ishpeming HS; Robert Glover, Marquette Senior HS; Jordan Simula, Marquette Senior HS

Not Pictured: Jessica Barber, Marquette Senior HS; Anna Cole, Gwinn HS; Jim Mallos, Marquette Senior HS; Elena McCombie, Marquette Senior HS; Aaron Smith, North Star Academy; Kalysta Smith, Marquette Alternative HS; Harley Veiht, Negaunee HS

Middle College

WHO CAN PARTICIPATE?

The Middle College exists for all students, from the 4.0 student who needs a challenge to those students who have traditionally been underserved, especially those who are unengaged and at risk of dropping out of high school, economically disadvantaged and first-generation college students.

Teachers, counselors and administrators in our local schools will help to identify students who are capable of being successful at the college level, including those who previously had no plans to attend college. The program will consider students who are willing to:

- Commit to a five-year program of study, which includes a mix of high school and college classes in Grades 11 and 12 and a full college schedule at NMU in Grade 13.
- Pursue either a Career and Technical Education (vocational) or STEM (Science, Technology, Engineering and Mathematics) college certificate/degree program. Many options are available!

This educational option is the result of extraordinary collaboration between local school districts, the Marquette-Alger Regional Educational Agency, Northern Michigan University, Great Lakes Center for Youth Development, the Eagle Mine, MichiganWorks! and other business and industry partners. The MATMC is funded through a combination of local, state and federal funding sources, grants and corporate/business/community sponsorships.

WHY LIMIT STUDENTS TO PURSUING A CTE OR STEM DEGREE?

These are the two career areas where the greatest skills gap exists in our region, state and nation. Placement rates for most of these programs at NMU are at, or near, 100%. It provides a strong incentive for students to move into a career that is needed to sustain and grow our economy, leading to both a degree and viable employment.

HOW/WHEN CAN A STUDENT APPLY?

Students apply during the second semester of their high school sophomore year. They are required to submit an essay, letters of recommendation and, along with their parents, participate in an interview.

HOW DOES IT WORK?

Accepted students enroll in the MATMC prior to their junior year (Grade 11) of high school and take one dual enrollment course at NMU during the second semester of that year. Students will take a minimum of one dual enrollment course during each semester of their senior (Grade 12) year. While enrolled, students will participate in Success Seminars and receive support to prepare them academically and socially with the goal that students are ready for the rigor of a full college course load during Grade 13.

Eagle Mine

a subsidiary of **lundin mining**

While the primary source of funding for the Technical Middle College is provided by the State of Michigan, Eagle Mine's commitment to the program is \$250,000 over three years (2015 to 2017) with the intent to renew support of the Middle College through Eagle's eight year mine life ending in 2022. Eagle Mine's initial support of \$50,000 in 2015 will be used to supplement the state per-pupil funding, resulting in no cost to the student or their families to participate in the program. Beginning in 2016, Eagle will make an annual contribution of \$100,000, with \$50,000 of it being used to directly support the program and the other \$50,000 being used to establish an endowment fund. This model of funding aims to sustain the program long after Eagle Mine ceases operations.



WHAT CERTIFICATES/DEGREES CAN STUDENTS EARN?

All middle college graduates will earn the Michigan Early and Middle College Association Certificate. Currently, students have the option of pursuing one of the following associate degrees from NMU:

Middle College Health Sciences Academy

(Clinical Science Degrees):

- Clinical Laboratory Technology
- Radiography
- Surgical Technology

Middle College Industrial Maintenance Academy

- Industrial Maintenance

Degree options are being expanded and may include Building Technology, Electrical Technology, HVACR, Automotive Service Technology and Aviation Maintenance.

CONTACT: Brian Sarvello, bsarvello@maresa.org • 226-5135
VISIT: matechmc.org

Northern Promise

“Our goal is to provide every high school student in the Upper Peninsula with 12-15 transcribed college credits at no cost to them as a jump start on their post-secondary education.”

NMU PRESIDENT FRITZ ERICKSON

NO-COST COLLEGE

Northern Michigan University is making a promise to the Upper Peninsula to work with high schools, students, parents and business and industry to provide every U.P. high school student with the opportunity to complete 12-15 college credits prior to high school graduation at no tuition cost to students.

HOW DOES THE NORTHERN PROMISE WORK?

NMU is working with U.P. high schools to develop Northern Promise programs, which are college courses taken at high schools during the regular school day, at facilities within the district, online, on NMU's campus or as hybrid courses.

While participating in a Northern Promise program, high school students will also receive a Northern student identification card that can be used for many of the same services and facility access available to NMU students, as well as an NMU email account and academic transcript.

CONCURRENT ENROLLMENT PATH

This option is designed for high-achieving high school students—those already on a college-prep track with strong grade point averages who have demonstrated past academic success. The courses are predominantly geared toward college general education requirements, which will make the credits applicable and transferable to most universities. Students on this path take courses at their high schools and, most often, from their high school teachers.

CAREER-TECHNICAL PATH

A Marquette-based Career Technical Education collaboration in which Northern Michigan University is one of the participants helped to create the Marquette-Alger Technical Middle College (MATMC) pilot program in 2014-15, which continues to grow.

The MATMC enables students to earn a high school diploma and a significant number of college credits toward an NMU associate degree at no cost. Students commit to a five-year high school/college course of study in one of two academies: health science or technology, engineering and occupational science. Some of the course credits count for both high school and college while others are solely for the associate degree.

Class sessions are held at the high school and on Northern's campus. NMU is looking into opportunities for more middle college and other career-technical programs at high schools throughout the Upper Peninsula.

For more information about the Middle College, see the previous page.



Alexandria Rich from Superior Central High School is participating in the Health Science Academy



NORTHERN PROMISE BENEFITS

- Earn college credits
- Save money on tuition, fees and textbooks (and in some cases, also room and board or travel to and from campus)
- Reduce the time it takes to earn a college degree
- Reduce student debt
- Ease transition into the college/university setting
- Enhance academic resumé
- Reduce duplication of courses at the college level
- Fast-track the path into the workforce
- Improve job placement potential

CONTACT: NMU Office of Extended Learning and Community Engagement,
906-227-6766, promise@nmu.edu, nmu.edu/promise

Internships

HIGH SCHOOL INTERNSHIPS:

Interning in high school is a fantastic way to get some real world experience before heading off to college. Many students use internships as a strategy to help decide their college major, bolster their college application and network with influential people.

The Marquette-Alger Regional Educational Service Agency Internship Program is offered to high school seniors and features a 6-10 hour per week independent study course related to the student's career pathway. The non-paid work experience will be spent with a local business/agency where students are trained and supervised by one or more training site employees.

Internship students receive high school credit for successful completion of their internship. Grades are assigned by the internship coordinator and are based on a site supervisor evaluation, student maturity, learning progress and a daily written journal. Individual site supervisors may assign additional tasks. Prior to the start of an internship, the business, school, parent and student must all approve the training schedule and tasks. Students are expected to follow both the internship and business site attendance rules and policies and are responsible for their own transportation to and from their training site.

The internship application process requires completion of an application, resumé and recommendation from the school counselor. The student will then interview with the internship program coordinator and, if accepted, will then interview with a business or agency. High school juniors interested in applying for an internship during their senior year should contact their high school guidance counselor.

◆ Sample of internship sites

Integrated Design, Inc.
Marquette Downtown Development Authority
Marquette City Police
Marquette County Community Foundation
Northern Michigan University
Ishpeming Public Library
Stepping Stones Day Care
Northern Health Chiropractic
Eastwood Nursing Home
Active Physical Therapy
Good News Assembly of God
Marquette County Probate

CONTACT: Sandy Meyskens, MARESA
smeysken@marsa.org • 906-226-5139 • marsa.org



"In September 2008, I started a year-long internship, while I was attending Marquette Senior High, with a licensed architect at Integrated Designs Inc. (IDI). Under IDI's guidance, I was able to experience all that being an architect would entail. I went to meetings, worked on proposals and construction documents, went to construction sites, and I was able to see designs being created and suggest ideas.

By the end of the year, I felt like a part of the company and gained a lot of knowledge. I learned responsibility, professionalism, time management and many other skills.

I graduated from MSHS in May 2009, and shortly afterward, IDI called and offered me a paid position. I continued working for IDI while attending Northern Michigan University and eventually the University of Wisconsin-Milwaukee's Architecture and Urban Planning program, where I worked remotely in a part-time position.

After graduating with a bachelor's of science in architectural studies and a certificate in urban planning, I moved back to Marquette and was offered a full-time position with IDI. I am now working on my master's degree in architecture, and I hope to become a licensed architect within the next two years. The knowledge and skills I gained from my internship have been invaluable and will continue to guide my career."

MEGAN RITTER, ARCHITECT

PROFILE

Health Sciences

JOB SPOTLIGHT - Clinical Laboratory Technologist

Median Earnings



\$24/hr.

(earnings range: \$20 - \$40/hr.)

Projected Job Growth to 2024



+ 16% (National)
+ 4% (Michigan)

Education levels of current workers



11% high school
19% some college
17% associate degree
44% bachelor's degree
6% master's degree

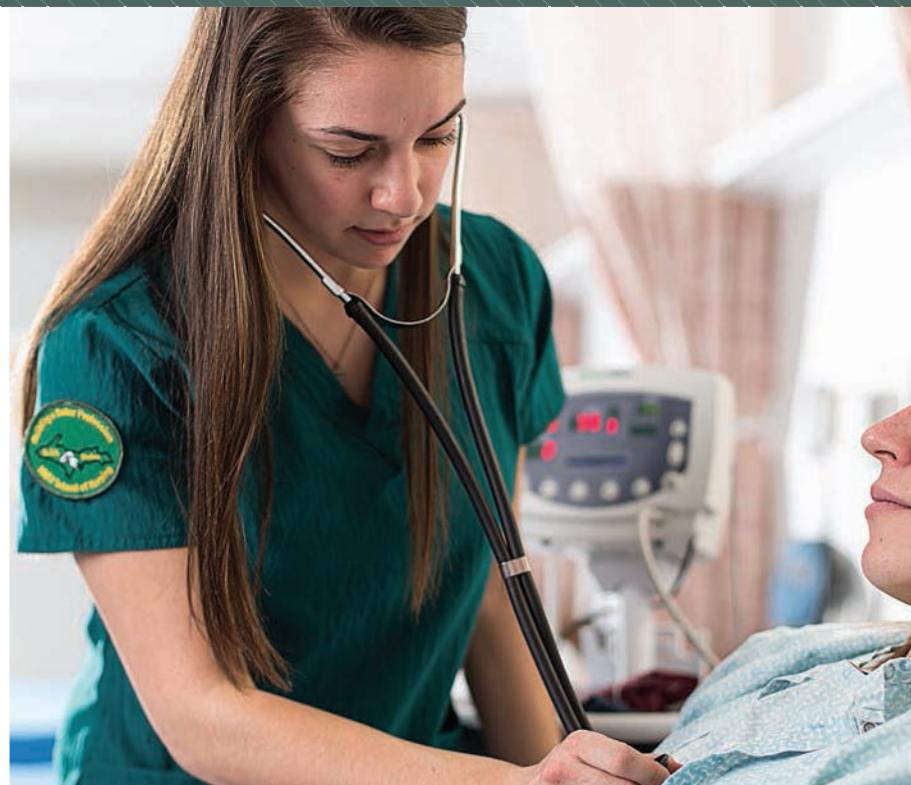
Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

ABOUT THE CAREER:

Work in a variety of clinical pathology laboratories or assist surgeons, perform testing which may impact patients and health sciences. Students select a concentration in a unique clinical emphasis and test to become certified to practice.

WHAT YOU'LL LEARN AND DO:

Collect, prepare and analyze specimens, blood, bodily fluids or DNA. Use microscopes, cell counters, chemistry analyzers and molecular diagnostic equipment.



JOB SPOTLIGHT - Speech-Language Pathologist

Median Earnings



\$34/hr.

(earnings range: \$22 - \$53/hr.)

Projected Job Growth to 2024



+ 21% (National)
+ 9 (Michigan)

Education levels of current workers



10% bachelor's degree
87% master's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

ABOUT THE CAREER:

A speech-language pathologist helps those who stutter, have a disability, have had a stroke or other trauma or hearing impairments to increase their fluency, language and speech skills and assist their families. Practitioners must attain a master's or doctorate degree and will work for school systems, hospitals, community health agencies or in private practice.

WHAT YOU'LL LEARN AND DO:

Phonetics, audiology, language disorders, cognitive neuroscience, methods of diagnosis and treatment; how to work with a variety of populations.

JOB SPOTLIGHT - Nursing: Registered Nurse

Median Earnings



\$32/hr.

(earnings range: \$22 - \$48/hr.)

Projected Job Growth to 2024



+ 16% (National)
+ 11% (Michigan)

Education levels of current workers



5% some college
38% associate degree
46% bachelor's degree
8% master's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

ABOUT THE CAREER:

Nurses are concerned with the "whole person." They provide for physical, mental and emotional needs of patients. They work in a variety of settings. Opportunities are available for many different levels of education and specialties within the field.

WHAT YOU'LL LEARN AND DO:

Learn anatomy, physiology and pharmacy; observe, assess, record symptoms, reactions and progress; supervise others; manage stress and emergencies; work with physicians.

For more information about our graduation rates, the median debt of students who completed the program, and other important information, please see nmu.edu/institutionalresearch/disclosure

Clinical Sciences / Speech, Language and Hearing Science / Nursing / Pre-Medical

JOB SPOTLIGHT - Surgical Technologist

Median Earnings



\$20/hr.

(earnings range: \$15 - \$30/hr.)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 15% (National)
+ 20% (Michigan)

Education levels of current workers



25% high school
34% some college
20% bachelor's degree
16% master's degree

ABOUT THE CAREER:

Scrub surgical technologists handle the instruments, supplies and equipment necessary during the surgical procedure. They have an understanding of the procedure being performed and anticipate the needs of the surgeon.

WHAT YOU'LL LEARN AND DO:

Setting up sterile trays and equipment for procedures; scrubbing; draping patients, passing instruments and holding retractors; sterilizing instruments and supplies; and maintaining stock inventory.

High school CTE program

The Health Occupations high school program seeks qualified and motivated students and prepares them for pursuit of appropriate health careers. Curriculum concepts incorporate technological advances related to the health care delivery system, including ethics, professionalism, prevention (wellness), patient/client diagnosis, treatment, care and rehabilitation as a result of disease/disorders. Opportunities for expanded leadership, management, technical and citizenship development are available through membership in the Health Occupations Students of America (HOSA). Students also complete a semester-long clinical rotation at UP Health System. Available to students in Grade 12 and offered at Marquette and Ishpeming High Schools (also open to students from Negaunee and Westwood).

NMU Programs

CLINICAL SCIENCES Certificate

Clinical Assistant

Associate Degrees

Clinical Laboratory Technology
Radiography
Surgical Technology

Bachelor's Degrees

Speech, Language and Hearing Sciences
Clinical Health Science
Clinical Laboratory Science

Concentrations:

Anatomic Pathology
Clinical Systems Analyst
Diagnostic Genetics
Laboratory Medicine
Microbiology
Science Technologist

Master's Degree

Clinical Molecular Genetics

NURSING Certificate

Practical Nursing

Bachelor's Degrees

Nursing (BSN)
LPN to BSN
RN to BSN

Doctorate

Family Nurse Practitioner

PRE-MEDICAL

4 year pre-professional program (students select a major and take additional specific classes)



PROFILE

"I really like that the hospital is so close to campus, that will offer me a lot of amazing opportunities once I get into the nursing program.

Also, I like that there is a club, the Student Nurses Association, which helps out around the community while representing the NMU nursing school."

STACIA CZYZIO, NURSING MAJOR FROM FLUSHING, MICHIGAN

CONTACT: School of Health Sciences and Professional Studies 906-227-2435
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Automotive

JOB SPOTLIGHT - Service Technician and Mechanic

Median Earnings



\$18/hr.

(earnings range: \$10 - \$30/hr.)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 5% (National)
+ 11% (Michigan)

Education levels of current workers



44% high school diploma
22% some college
11% associate degree
3% bachelor's degree

CAREER PATH

College: certificate and associate degree, state certification
Apprentice Programs: Sheetmetal, Painter, Operator
High School: enter the workforce

ABOUT THE CAREER:

Automotive technicians and mechanics provide service and diagnostic procedures necessary to maintain and repair vehicles. The career offers a variety of opportunities ranging from drivability technician, alignment and suspension specialist, transmission specialist, service advisors and managers. Opportunities for advancement may include factory and dealer representatives, management and self-employment. Work at dealerships, independent garages, service stations and automotive stores.

WHAT YOU'LL LEARN AND DO:

- Train in modern laboratories equipped with current service and testing equipment.
- Work on steering, suspension and alignment, brakes, engines, electrical/electronic systems, drive trains, axles, transmissions, heating and air conditioning.

◆ High school CTE program

A MARESA/NMU high school program in Automotive Service Technology is offered at the Jacobetti Complex and is available to students in Grades 11 & 12 from all Marquette and Alger County high schools.

● NMU Programs

Certificate program (1 year)

Automotive Service

Jobs: service technician, parts salesperson, repair specialist.

Associate Degree (2 years)

Automotive Service Technology

Jobs: auto body, electrical or service technician; brakes, engine repair, suspension or transmission specialist; glass installer; estimator; service manager; industrial salesperson. Students are encouraged to take the State of Michigan certification exam in order to be better qualified for employment.



PROFILE

"At first I got interested in auto repair out of necessity," says Stephen Stewart, an NMU student from Niles, Michigan. "It started as a hobby to save money on fixing my own vehicles, but then I realized it could also be a way to make money as a career." He is currently employed at a local dealership as an auto technician and recently graduated with an associate degree. Even with his on-the-job experience, Stephen has found the program to be helpful and exciting.

"I enjoy that in addition to theory, we get ample hands-on time in the auto lab. This gives myself and other students the chance to apply what we read in books and cover during lecture. The automotive instructors are especially helpfully whenever I have reached out for further help."



FACT:

40% of the automotive service workforce is age 45 or older, so there will be a large need for new technicians to replace those who retire.

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jbugni@nmu.edu • 906-227-1538 • nmu.edu/tos
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Aviation

JOB SPOTLIGHT - Aircraft Mechanics and Service Technician

Median Earnings



\$27/hr.

(earnings range: \$17 - \$42/hr.)

Projected Job Growth to 2024



+ 1% (National)
+ 1% (Michigan)

Education levels of current workers



28% high school diploma
40% some college
21% associate degree
9% bachelor's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

College: options from one-year certificate to 2.5 year associate degree

Apprentice Programs: Electrician • Sheetmetal

High School: enter a training program offered by an air carrier

ABOUT THE CAREER:

Aircraft and avionics equipment mechanics and service technicians keep aircrafts in peak operating condition, perform scheduled maintenance, make repairs and complete inspections required by the Federal Aviation Administration (FAA). Some may specialize in working on a particular type of aircraft or mechanical system.

WHAT YOU'LL LEARN AND DO:

Students work in the following five lab areas: powerplant, airframe, nondestructive testing, composite and sheet metal. Students do engine run-ups, repair and restoration of the operational status of the aircraft.

◆ High school CTE program

A MARESA/NMU high school program in Aviation Maintenance is available to students in Grades 11 & 12 from all Marquette and Alger County high schools. Students train at NMU's Jacobetti Complex aviation labs.

● NMU Programs

Certificate program (1 year)

Aviation Maintenance Technology

Jobs: licensed A&P technicians—maintenance technicians and/or aircraft mechanics employed by major and commuter airlines, corporate aviation groups and the manufacturing industry. Some are self-employed, while others are hired by the federal government or armed forces.

◆ Associate degree (2 years)

Aviation Maintenance Technology

Jobs: maintenance technicians and/or aircraft mechanics employed by the same groups as above. In addition, associate degree graduates may also be prepared to fill entry-level management or supervisory level jobs in the aviation industry.

● Bachelor's degree (4 years)

Industrial Technologies

All credits from the aviation associate degree can be applied to this bachelor's program to increase earning power and expand job possibilities with enhanced technical and management skills. See more in the "Industrial" section of this magazine.



Charles Morey of Alma, Michigan, an NMU industrial technology major with an aviation maintenance degree, put his knowledge and courage to work this past summer. He flew to Alaska without a job or living arrangements to look for an airplane mechanic job. Within three days of flying to Alaska and handing out his resume, he accepted a job maintaining a fleet of 12 aircraft in the "bush," near Iliamna, Alaska, population of 109. Charlie says, "I felt confident heading up to Alaska without a job. My professors were great resources, saying it was possible. So I did just that, based on their recommendation." He adds, "The hands-on experience in the classroom was really good. Going into the job field I felt super prepared."

CONTACT: Mark Matteson

mmatteso@nmu.edu • 906-227-1529 • nmu.edu/tos

High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

PROFILE

Construction

JOB SPOTLIGHT - Construction Manager

Median Earnings



\$41/hr.

(earnings range: \$25 - \$72/hr.)

Projected Job Growth to 2024



+ 5% (National)
+ 13% (Michigan)

Education levels of current workers



27% high school diploma
25% some college
8% associate degree
28% bachelor's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

College: options from one-year to four-year or master's degree programs in specialty fields such as climate control or estimating or overall skills as construction site manager

Apprentice Programs: Carpenter, Electrician, Plumber/Pipefitter, Painter, Bricklayer, Laborer

High School: work for area contractors, become a licensed contractor

WHAT YOU'LL LEARN AND DO:

Estimating, layout, blueprint reading, foundation and cement work, rough-in carpentry, roofing, wiring, interior and exterior finishing and siding, finish carpentry, possibly supervising workers.

WHAT'S HOT RIGHT NOW!

HVACR

Climate Control Technology

Jobs: Heating, ventilation, air conditioning and refrigeration specialists work on heating, ventilation, cooling and refrigeration systems that control the temperature and air quality in buildings. HVACR technicians work mostly in homes, schools, hospitals, office buildings or factories.

Median Earnings



\$21/hr.

Projected Job Growth to 2024



14% (National)



CONTACT: Heidi Blanck
blanck@nmu.edu • 906-227-1721 • nmu.edu/tos
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Construction

◆ High school CTE program

Learn carpentry and construction skills by participating in the construction of a variety of projects, including large commercial buildings. Students are prepared for entry-level employment skills in the construction field and for participation in college-level construction-related programs such as construction management, construction engineering and architecture. Available to students in grades 10-12 at Ishpeming, Munising, Marquette, Superior Central and Westwood High Schools.

● NMU Programs

Certificate program (1 year)

Heating, Ventilation, Air Conditioning and Refrigeration (HVACR)

Jobs: HVACR technician, apprentice and/or journeyman mechanic, installer, service technician, salesperson or estimator in a wide variety of settings.

Associate degrees (2 years)

Building Technology

Jobs: carpenter, building inspector, building maintenance technician, material salesperson, cement finisher, construction foreman, assistant estimator, surveyor, concrete and/or steel detailer, structural drafter, expediter and more.

Climate Control Technology

Jobs: HVACR specialist creating comfortable, healthy, and energy-efficient indoor environments, including for the storage of food and medicine, transportation, warehouses, factories and many other essential settings.

Bachelor's degree (4 years)

Construction Management

Jobs: construction planner, site supervisor, scheduler, cost estimator, assistant project manager, logistics manager, environmental controller, building inspector and contractor. With specialized training: electrician, plumber or HVACR contractor. Construction managers apply a unique grouping of management techniques to the planning, design and construction of a project in order to control the time and cost to complete the project and the quality of the construction.



PROFILE

“This major has given me endless opportunities to further myself with the career fairs and other workshops that are available. Last summer I interned for Hill & Wilkinson in Dallas. I was put on a Mercedes Benz dealership and got to see the project develop at an early stage. I stayed in contact with my superintendent after I left and got to see it finish. The connections I have made through this major are extremely beneficial.

Also, I've found that most universities do not have the hands-on classes that we have here at NMU. One of my favorite classes was Concrete, where I actually got to lay brick and CMU [concrete blocks].”

GABRIELLA GARZA, A CONSTRUCTION MANAGEMENT MAJOR WITH A BUSINESS ADMINISTRATION MINOR, FROM WILLIAMSTON, MICHIGAN

★ FACT:

The Superior Plumbing & Mechanical Contractor's Association offers a paid apprenticeship program for highschoolers.

Contact: Scott Duer at 249-1441

Electrical

JOB SPOTLIGHT - Electrical Engineer

Median Earnings



\$45/hr.

(earnings range: \$28 - \$69/hr.)

Projected Job Growth to 2024



+ 0% (National)
+ 11% (Michigan)

Education levels of current workers



3% high school diploma
9% some college
9% associate degree
49% bachelor's degree
25% master's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

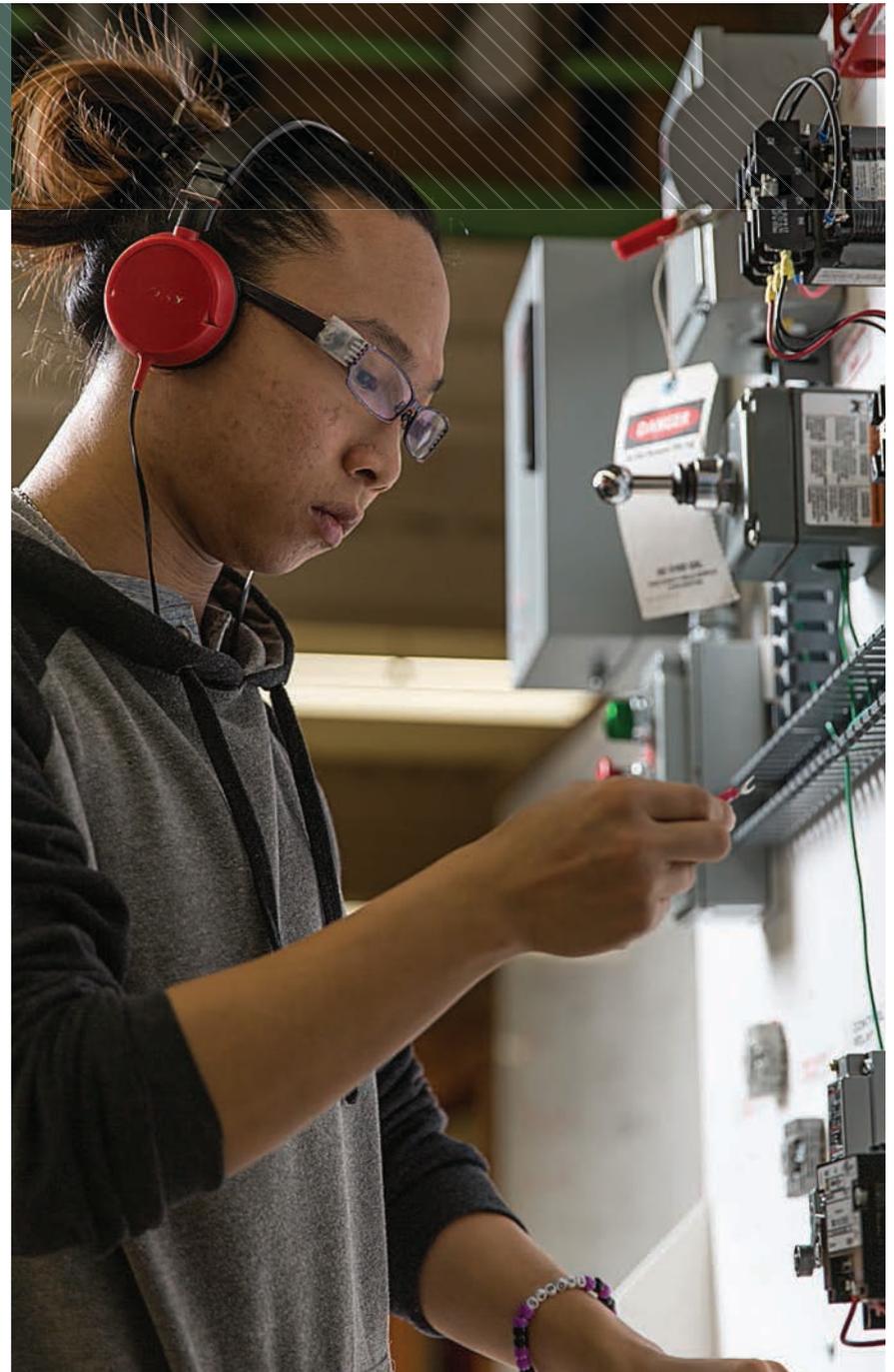
College: paid internship; diploma to bachelor's and beyond
Apprentice Programs: Electrician (programs offered for all U.P. counties)
High School: work as an entry-level assistant

ABOUT THE CAREER:

This field provides a wide range of choices for career paths. You could work for the power industry on systems that run thousands of volts and power the entire country. Or work for a company such as Intel that makes the chips that power laptops, tablets and phones on only one to two volts. Or lead the way with alternative energy. Locally, you might work for Cliff's Natural Resources, Eagle Mine or Potlatch. There are a multitude of opportunities within these areas and many others, from field service to manufacturing.

WHAT YOU'LL LEARN AND DO:

- Get a strong background in AC and DC circuit analysis, analog and digital electronics
- Knowledge of industrial machines, controls and systems
- Experience with programmable controllers (PLC's) and process control systems
- Embedded system / microcontroller programming and design
- Testing and data acquisition processes and techniques



FACT:

Electrical Power Technicians are in very high demand and work nationwide with very high pay.

CONTACT: Mike Rudisill
engtech@nmu.edu • 906-227-2141 • nmu.edu/tos
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Electrical

◆ High school CTE program

A high school program in Electrical and Electronic Equipment Installation & Repair prepares students to apply technical knowledge and skills to operate, maintain, and repair electrical and electronic equipment. It includes instruction in electrical circuitry, simple gearing, linkages and lubrication of machines and appliances and the use of testing equipment. Available to students in grades 11 & 12 and offered at Westwood High School, but also open to students from Ishpeming and Negaunee.

● NMU Programs

Diploma (1 year)

Electrical Line Technician

Jobs: line technician employed by public utilities, electrical transmission contractors and related employers. A program in partnership with the Lake Superior Community Partnership Foundation, offered at a special training facility at K.I. Sawyer. See page 30 for more information.

Associate degree (2 years)

Electrical Technology

Choose from a concentration in:

- **Electrical Power Technician.** Jobs: electrical utility field—a very high demand career field with excellent compensation.
- **General Electronics.** Jobs: customize your studies to meet your interests and career goals, whether it's making electric guitars or working with alternative energy.
- **Industrial Electrical.** Jobs: paper mills to manufacturing facilities installing, maintaining or repairing industrial electrical equipment and machines.

Bachelor's degree (4 years)

Electronics Engineering Technology

Jobs: In a variety of fields including product design, prototyping, testing, automation/robotics, computers, instrumentation and maintenance.

Minor

Alternative Energies

Jobs: Work for solar, wind or bio-energy companies or startups.



PROFILE

“The teachers are very knowledgeable in what they’re teaching. And this is an incredibly hands-on program, making it very easy to learn since you’re not just reading a textbook but getting hands-on experience. I’ve also been working in NMU’s Audio Visual Department and have been able to learn so much about how both components and electricity work together.”

MICHAEL DONNERMEYER, AN ELECTRICAL ENGINEERING TECHNOLOGIES MAJOR FROM BONDUEL, WISCONSIN

Industrial

JOB SPOTLIGHT - Industrial Machinery Mechanic

Median Earnings



\$23/hr.

(earnings range: \$15 - \$35/hr.)

Projected Job Growth to 2024



+ 16% (National)
+ 25% (Michigan)

Education levels of current workers



43% high school diploma
29% some college
12% associate degree
5% bachelor's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

College: internships, certificate, associate, bachelor's
Apprentice Programs: ironworker, millwright, plumber, sheet metal, boiler maker. **High School:** start an entry-level career

ABOUT THE CAREER:

Manage or run a manufacturing or other industrial facility or work as a technician to install, maintain and repair all types of machinery used in an endless array of modern power transmission applications. Mines, paper mills, hospitals and manufacturing companies of all sorts require the services of skilled industrial maintenance technicians to keep their operations running smoothly. Welding is a specialty that is in very high demand. Another option is to become a teacher to train and inspire future technicians.

WHAT YOU'LL LEARN AND DO:

- Strong background in static and dynamic forces, materials design
- Knowledge of industrial machines, controls and systems
- Experience with Computer Aided Design and simulation software
- Experience with solid modeling and finite element analysis
- Materials properties and testing techniques
- System testing and data acquisition processes and techniques
- Supervisory and management skills
- Knowledge of metals, welding processes and applications (welding program)



FACT:

While hands-on technical training is essential to this career, research, writing, critical thinking and problem solving are also necessary in today's job market.

CONTACT: John Centko
jcentko@nmu.edu • 906-227-2190 • nmu.edu/tos
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Industrial

◆ High school CTE program

A high school program in welding prepares students for entry-level jobs or further education. The instructional format is self-paced. American Welding Society Certification tests are available to students in ARC, MIG and flux core ARC welding, leading to a nationally recognized certificate valuable for securing employment. Students will also receive an introduction to basic machining principles including work on a mill and lathe. The programs are typically available to students in grades 10-12 and are offered at Negaunee and Westwood High Schools. In addition, a MARESA/NMU high school program in welding is offered at the NMU Jacobetti Complex and available to students in Grades 11 & 12 from all Marquette and Alger County high schools.

● NMU Programs

Certificate programs (1 year)

Industrial Maintenance

Jobs: maintenance technician, equipment rigger.

Welding

Jobs: Production welder, weld inspector, engineer, plumber, pipefitter, boilermaker, salesperson, consultant.

Associate degree (2 years)

Industrial Maintenance Technology

Jobs: engineering, industrial or manufacturing technician; industrial engineering analyst; methods or process engineer or analyst; production staff worker; quality control engineering technician.

Bachelor's degrees (4 years)

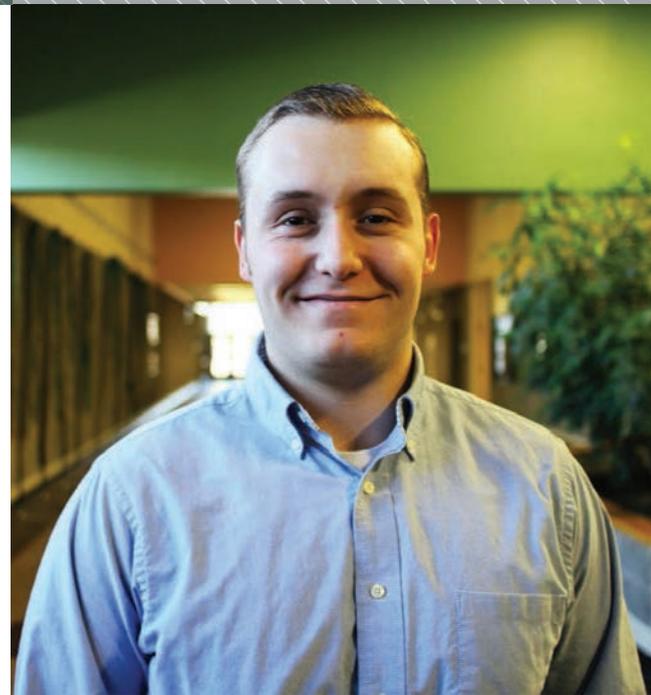
Industrial Technologies

With the technical focus of your degree set by your associate degree or minor, the job possibilities are practically unlimited, whether your interest is aviation, CNC machining, HVAC or virtually any other technical area.

Jobs: product integrity engineer, head of operations and logistics, liaison engineer, asset management manager, materials/production planner, planner/scheduler; production control supervisor, quality management coordinator, quality tech, senior quality methods specialist.

Secondary Education Industrial Technology

Jobs: Industrial technology teacher in elementary, middle or high school. Become certified to teach courses in woodworking, welding, machining and/or computers and computer aided design (CAD). A teaching minor will also allow you to instruct areas outside of technology.



PROFILE

"Northern has been a part of my family's history for over 100 years and I decided to continue the tradition. Becoming a shop teacher is something I have wanted to do since I was a little boy.

During my first semester I was hired as a work study student at the Jacobetti Center. I spent many hours in the machine shop working and learning about machining outside of class. Working with my advisor, Dr. Polkinghorne, I have learned so much in such a short amount of time. Also, it's nice being able to help out in a lab setting; it will help when I have a lab of my own one day. I also like being a member and the president of the Student Industrial Technology Education Society."

KIRK GUCKENBERG, AN INDUSTRIAL TECHNOLOGY EDUCATION MAJOR FROM ISHPEMING, MICHIGAN

Mechanical

JOB SPOTLIGHT - Mechanical Engineer

Median Earnings



\$40/hr.

(earnings range: \$26 - \$61/hr.)

Earnings, job growth and education levels noted in this publication are from Economic Modeling Specialists Intl. (EMSI) and the Occupational Information Network (O*NET).

Projected Job Growth to 2024



+ 5% (National)
+ 13% (Michigan)

Education levels of current workers



5% high school diploma
10% some college
11% associate degree
52% bachelor's degree
20% master's degree

CAREER PATH

College: paid internship; certificate to bachelor's and beyond
Apprentice Programs: Millwright
High School: work as an entry-level CAD technician

ABOUT THE CAREER:

Mechanical engineering technology involves design, testing, production and utilization of all types of mechanical equipment. Employment may be in product design, prototyping, product testing, automation/robotics, instrumentation, hydraulics, fluid systems and manufacturing.

Engineering design uses Computer Aided Design (CAD) programs and other computer-based programs to design and create mechanical part devices.

Designers work with clients to create a customized item, using hand or computer sketches and wood, clay or plastic models to create prototypes and then work with manufacturers for the finished product. Industries such as automotive, toy, appliance, medical equipment, furniture, tool, housewares and construction often contract these services.

WHAT YOU'LL LEARN AND DO:

- Static and dynamic forces, materials and product development, design and testing
- Industrial machines, controls and systems
- Computer Aided Design and simulation software
- Solid modeling and finite element analysis
- Electricity, hydraulics and material science
- Machining skills & CNC machine operation and programming
- Geometric dimensioning and tolerancing



FACT:

Many companies solicit NMU mechanical engineering students for paid summer internships. In fact, there are typically more positions available than students to fill them.

CONTACT: Mike Rudisill
engtech@nmu.edu • 906-227-2141 • nmu.edu/engineering
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Mechanical

◆ High school CTE program

A high school program in Drafting and Design Technology prepares students to enter the workforce or college as a skilled CAD technician. Students will graduate with advanced CAD skills by training on the most current CAD software. Students complete 2D and 3D projects with an emphasis on constructing what you design using advanced and specialized computer-aided drafting skills. The programs are typically available to students in grades 10-12 and are offered at Gwinn and Negaunee High Schools.

● NMU Programs

Certificate program (1 year)

Computer Numerical Control Technician

Jobs: program and operate computer-driven machine tools to create precision components used in most high-tech products.

Welding

Jobs: production welder, weld inspector, engineer, plumber, pipefitter, boilermaker, salesperson, consultant.

Associate degree (2 years)

Engineering Design

Jobs: CAD designer, engineering tech, mechanical designer. Employed by local companies such as RTI Surgical or Boss Plow.

Bachelor's degree (4 years)

Mechanical Engineering

Jobs: design, dimensional control, manufacturing, mechanical, process, product or product engineer.



PROFILE

Rachel Griep is a senior at Northern Michigan University studying mechanical engineering technology with a concentration in design. Upon graduating, Rachel would like to engineer the next big thing to impact the world.

In the meantime, she is working at Invent@NMU, gaining valuable hands-on knowledge on how to effectively support product development and operations.

"It's a great opportunity to apply what I'm learning in the classroom and to get experience working in my field before I leave college," says Rachel. "This gives me a foot in the door to a mechanical engineering career. I'll be able to show how I've helped a product make it to market and the connections I make along the way will be very valuable."

Hospitality

JOB SPOTLIGHT - Lodging Manager

Median Earnings



\$23/hr.

(earnings range: \$14 - \$46/hr.)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 8% (National)
+ 11% (Michigan)

Education levels of current workers



20% high school diploma
26% some college
10% associate degree
30% bachelor's degree
9% master's degree

CAREER PATH

College: internships; associate to bachelor's degree and beyond
Apprentice Programs: No formal programs in U.P.
High School: Work in the field while in school; MARESA/NMU; entry level careers

ABOUT THE CAREER:

This career has a wide range of opportunities for those seeking a supervisory or leadership position in the hospitality and tourism industry. Skilled professionals work as general and assistant managers, hotel and restaurant managers, executive chefs or front line supervisors. They are sought after by government employers, such as the School Food Administration, Food and Drug Administration, Health Services and correctional facilities, as well as by many businesses and companies within the hospitality industry, such as cruise lines, hospitals, educational institutions and casinos. Others are self-employed as caterers, restaurant owners and operators, personal chefs, hotel and lodging operators and bed and breakfast owners and operators.

WHAT YOU'LL LEARN AND DO:

Hospitality management, professional cooking, hospitality service management, hotel and lodging operations, hospitality operations plan and design, and marketing. Also how to coordinate front-office hotel activities, and manage staff and finances.

Students in NMU's hospitality management program operate an on-campus restaurant (Chez Nous) that is open to the public. Students create, prepare and serve a five-course dinner twice weekly that rivals top restaurants and resorts.

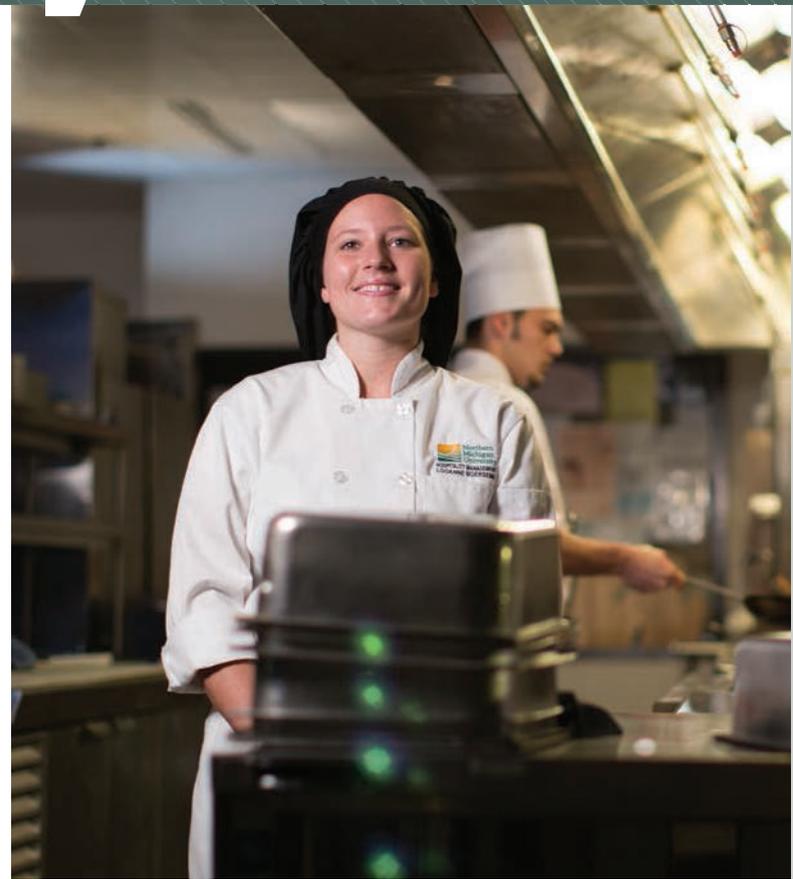
◆ High school CTE program

A MARESA/NMU high school program in Culinary and Hospitality Services is offered at NMU's Jacobetti Complex and is available to students in Grades 11 & 12 from all Marquette and Alger County high schools.

● NMU Programs

Associate degree (2 years)
Food Service Management

Bachelor's degree (4 years)
Hospitality and Tourism Management



PROFILE

Loganne Boersema is in her first year as a full time instructor within Northern Michigan University's Hospitality and Tourism Management program. A graduate of NMU's hospitality management program, she has also taught the Marquette Alger RESA High School Culinary Arts program.

Loganne has worked in the food service industry for ten years, holding multiple positions within and around the kitchen or bakeshop. She enjoys sharing her knowledge with students along with learning beside them.

In her free time, Loganne enjoys the woods and water. Skiing, canoeing, fishing and hiking are a few of her favorites— along with playing in the kitchen, of course.

CONTACT: Chris Kibit
ckibit@nmu.edu • 906-227-1544 • nmu.edu/tos
High School CTE: Brian Sarvello • bsarvello@maresa.org • 226-5135

Food Service

JOB SPOTLIGHT - Food Service Manager

Median Earnings



\$23/hr.

(earnings range: \$14 - \$40/hr.)

Projected Job Growth to 2024



+ 5% (National)
+ 5% (Michigan)

Education levels of current workers



29% high school diploma
28% some college
9% associate degree
21% bachelor's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

College: internships; associate to bachelor's degree and beyond
Apprentice Programs: No formal programs in U.P.
High School: Work in the field while in school; MARESA/NMU; entry level careers

ABOUT THE CAREER:

Food service managers are sought by restaurants, institutional food service co-ops, educational institutions, hospitals, hotels, conference centers, resorts, casinos, nursing and personal care facilities and catering services for positions as various types of cooks, chefs, deli workers and food service workers and managers.

WHAT YOU'LL LEARN AND DO:

Select and price menu items, use food and other supplies efficiently and achieve the highest quality preparation and service skills. Students will prepare for professional positions in food service and baking.

◆ High school CTE program

A MARESA/NMU high school program in Culinary and Hospitality Services is offered at NMU's Jacobetti Complex and is available to students in Grades 11 & 12 from all Marquette and Alger County high schools.

● NMU Programs

Associate degree (2 years)
Food Service Management

Bachelor's degree (4 years)
Hospitality and Tourism Management



Cosmetology

JOB SPOTLIGHT - Hairdresser, Cosmetologist

Annual Wages



\$23,000 - \$45,000
(earnings range: \$9 - \$22/hr.)

Projected Job Growth to 2024



+ 10% (National)
+ 12% (Michigan)

Education levels of current workers



46% high school diploma
33% some college
9% associate degree
4% bachelor's degree

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

CAREER PATH

College: certificate

Apprentice Programs: on-the-job training may be available

High School: enter the workforce, specialized school or college training

ABOUT THE CAREER:

Graduates are employed as cosmetologists, skin care specialists, salon managers/owners, nail technicians, hair culturists, education specialists, manufacturers' representatives, makeup artists and retail specialists. While many graduates accept positions in barber shops and salons, others work in department stores, drug and cosmetic stores and educational facilities.

WHAT YOU'LL LEARN AND DO AT NMU:

In the **cosmetology certificate program**, students learn the theories and practical applications needed for entry-level positions in the cosmetology profession. In our new studios, students learn to perform such services as hair shaping, make up, hair color, chemical texturization, manicuring, pedicuring and scalp and facial treatments. These skills are practiced on the general public.

NMU's **cosmetology instructor program** trains the professional in Michigan law, teaching techniques, record keeping and administration of a school of cosmetology.

NMU Programs

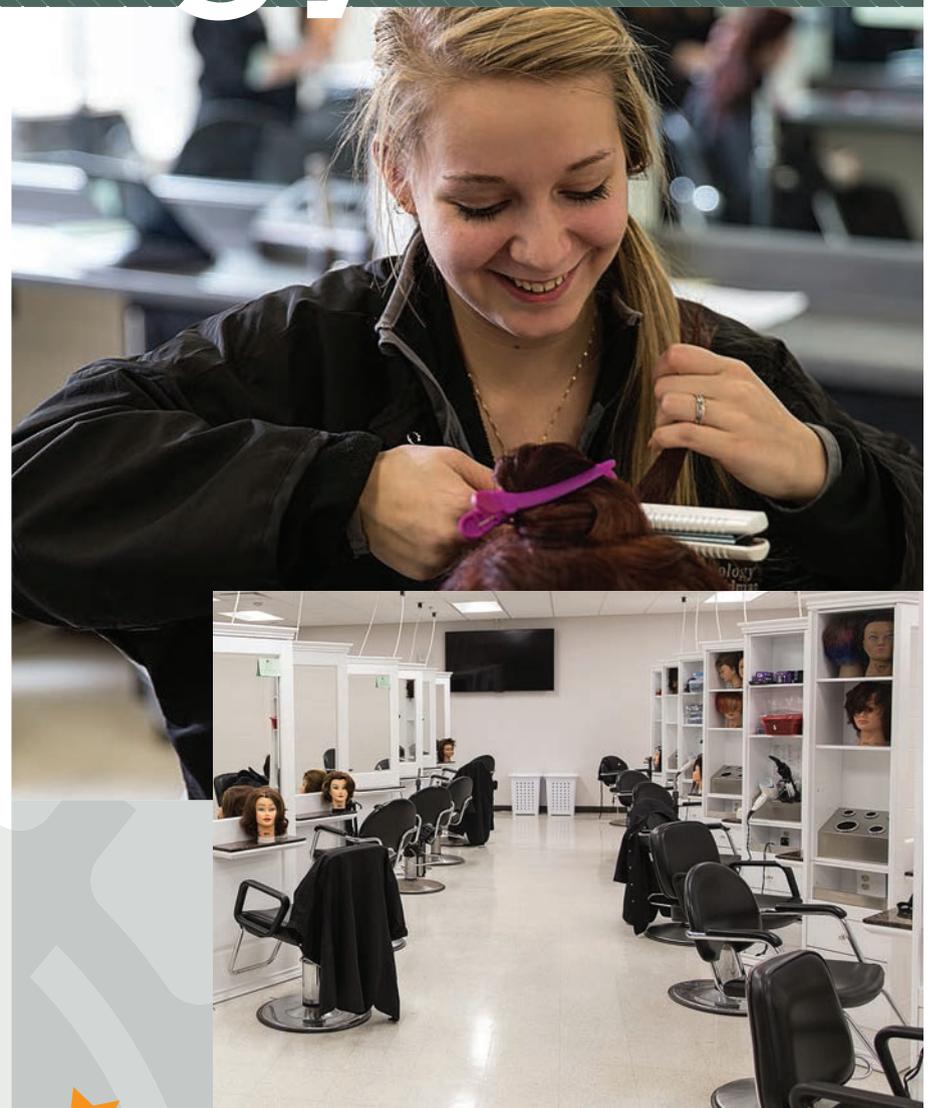
Certificate program (65 credits)

Cosmetology

Diploma program (18 credits)

Cosmetology instructor

The NMU Cosmetology Salon is open to the general public for hairstyling, manicures/pedicures, facials, perms, coloring, waxing and nails. Call 227-2383 to schedule your appointment Monday-Thursday 10 a.m to 3 p.m.



\$200,000 Studio Upgrade!

Finishing touches are just now being put on NMU's Jacobetti Complex Cosmetology Studio, which consists of two salons and a lobby area to greet patrons. Fresh flooring, bright white walls and sixteen new stations and comfortable customer chairs create a welcoming space. Massaging pedicure chairs are now available as well. Students benefit from video cameras and large screen televisions that allow them to better observe hands-on instruction and techniques. Stop by during the Jacobetti Open House to tour the new studio!

CONTACT: John Centko, Technology and Occupational Sciences
(906) 227-2190, jcentko@nmu.edu, nmu.edu/tos

Manufacturing

Manufacturing Production

JOB SPOTLIGHT - Assembler / Fabricator

Median Earnings



\$14/hr.

(earnings range: \$9- \$21/hr.)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 9% (National)
+ 12% (Michigan)

Education levels of current workers



48% high school diploma
21% some college
6% associate degree
5% bachelor's degree

CAREER PATH

College: diploma

Apprentice Programs: Laborer. Or may be offered by manufacturing companies.

High School: entry level career options



ABOUT THE CAREER:

Assemblers and fabricators assemble finished products and the parts that go into them. They use tools, machines and their hands to make engines, computers, aircraft, ships, boats, toys, electronic devices, control panels and more.

WHAT YOU'LL LEARN AND DO AT NMU:

The one-semester, hands-on **manufacturing production technician program** is scheduled to be offered in Escanaba this summer and may be offered in more locations in the U.P. and Michigan in the future. Students in the manufacturing production technician program gain a strong foundation in:

- the manufacturing process and the basic operation of equipment commonly used in manufacturing settings.
- work concepts such as time management, work ethic and attitude, team building and problem solving.
- blueprint reading.
- how to use precision measuring tools and equipment.
- occupational safety in an industrial setting.

Any student who completes this program is guaranteed a job interview for available positions at one of the program's partner businesses: Superior Extrusion, Argonics, VanAire, Systems Control, Verso, Potlach and Stewart Manufacturing.

In addition, some partners provide partial or complete tuition reimbursement. Many students also qualify for a \$775 scholarship and are eligible for financial aid consideration.

The program can be tailored to or offered in part to current workers at businesses as well.

★ A CRITICAL SHORTAGE

"Over the next decade nearly 3 1/2 million manufacturing jobs likely need to be filled. The skills gap is expected to result in 2 million of those jobs going unfilled...."

Eighty percent of manufacturing executives reported they are willing to pay more than the market rates in workforce areas reeling under the talent crisis. Still, six out of 10 positions remain unfilled due to the talent shortage. This clearly indicates there are not a sufficient number of workers in manufacturing to fill these positions...

Creating a supply of workers with manufacturing skills – engineering, skilled trades, and production – will be critical to the future competitiveness of companies and the industry as a whole."

From the report **The Skills Gap in U.S. Manufacturing 2015 and Beyond**, by The Manufacturing Institute and Deloitte.

CONTACT: John Centko, Technology and Occupational Sciences
(906) 227-2087, jcentko@nmu.edu, nmu.edu/mpt

Line Tech

Electrical & Power Technicians

JOB SPOTLIGHT - Electrical Power Line Installer/Repairer

Median Earnings



\$30/hr.

(earnings range: \$17 - \$45/hr)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 6% (National)
+ 7% (Michigan)

Education levels of current workers



45% high school diploma
32% some college
12% associate degree
5% bachelor's degree

CAREER PATH

College: diploma or associate degree

Apprentice Programs: On-the-job apprentice training after diploma

High School: entry level training or apprentice training

ABOUT THE CAREER:

Electrical line technicians install, maintain and operate joint gas and electric overhead and underground generational electrical transmission and distribution facilities as well as overhead electrical generation systems that supply electric energy to residential, commercial and industrial customers. They are employed by public utilities, electrical contractors and line construction companies.

WHAT YOU'LL LEARN AND DO AT NMU:

Students in Northern's **electrical line technician diploma program** combine learning about electrical theory with hands-on training at the NMU/Midwest Skills Development Center 20-acre line tech training campus at K.I. Sawyer. Students learn how to:

- Construct electrical transmission systems
- Climb towers and poles
- Identify substation components
- Operate electrical power distribution systems

Graduates of the program are then qualified to train as apprentices.

High School CTE Programs

Westwood High School offers a program in Electrical/Electrical Equipment Installation and Repair. In addition, the Middle College TEOSA Academy offers an electrical technology track.

NMU Programs

Diploma (1 year)

Electrical Line Technician

Associate degree (2 years)

Electrical Technology - Electrical Power Technician concentration

CONTACT: Line Tech – NMU Technology & Occupational Sciences Department, nmu.edu/tos or Lake Superior Community Partnership Foundation, 906-226-9658.
Power Tech - NMU Engineering Technology Department, nmu.edu/engineering.



Courtesy UPPCO

PROFILE

"Not everyone is cut out to do a four-year college degree just like not everyone is cut out to be a lineman. Line school is different than regular school because you actually work and you learn part of the trade. The instructors are excellent and prepared us to move into the workforce as apprentice linemen in only 10 months. There is no other school that you can go to for 10 months and come out making the money you do. I am now a Lead Lineman at UPPCO and I have been here for 11 years. I highly recommend this school to anyone that is motivated, hard working, mechanical and smart. You will not regret being in the electrical industry. It is very rewarding and profitable."

JAMIE SUNDBERG, UPPCO LEAD LINEMAN

JOB SPOTLIGHT: Wind Turbine Tech

Wind Turbine Technicians, also known as windtechs, install, maintain, and repair wind turbines. NMU's **electrical power technician program** is one of three concentrations you can choose from within the electrical technology associate degree. Students train on a full-size substation.

Median Earnings



\$23/hr.

Projected Job Growth to 2024



108% (Fastest growing job)

Environmental

Forest Products

JOB SPOTLIGHT - Forest and conservation worker

Median Earnings



\$32/hr.

(earnings range: \$13 - \$40/hr)

Earnings, job growth and education levels noted in this publication are from the U.S. Bureau of Labor Statistics (National), CareerOneStop/U.S. Department of Labor (Michigan) and O*Net (U.P.).

Projected Job Growth to 2024



+ 7% (National)
+ 9% (Michigan)

Education levels of current workers



31% high school diploma
17% some college
10% associate degree
13% bachelor's degree

CAREER PATH

College: Bachelor's for related careers such as forester or conservation scientist
Apprentice Programs: May be offered by lumber companies
High School: entry level career options

ABOUT THE CAREER:

Manage public and private forested lands for economic, recreational and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber's worth, negotiate the purchase and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth and determine optimal harvesting schedules.

WHAT YOU'LL LEARN AND DO:

Understand the relationships between Michigan's natural resources and the environment. Topics include energy and nutrient cycles, water resources and management, soil conservation, wildlife preservation and management, forest and fire management, lumber production, the outdoor recreation industry and multiple-use management.

NMU Programs

Bachelor's degrees (4 years)

Environmental Science - Natural Resources concentration

Biology - Ecology concentration

Specialized Training

- The Michigan Sustainable Forestry Initiative offers free education classes throughout the year. Contact Scott Robbins at 517-853-8880.
- The National Hardwood Lumber Association offers lumber grading short courses and a 12-week Lumber Inspector Training School. Contact MichiganWorks! to learn more: Marquette, 906-228-3075; Munising, 906-387-4937 or visit nhla.com.



Chris Bigger is a 19-year-old forwarder operator for JM Longyear in Marquette. Eventually he would like to become a processor operator and then a forester.

However, he hasn't always wanted to work in the forest industry. In high school, Chris thought about becoming a conservation officer and possibly pursuing a career in law enforcement, but eventually decided that his skills would be more valuable within the forest.

"I love operating equipment and I love being in the woods," he said. "Now I have the best of both worlds!" Chris operates different types of forest-related and non-forest-related equipment, such as skidders, dozers and backhoes.

While he enjoys the outdoors and hands-on aspects of his job, Chris especially likes being able to say that he followed in his father's footsteps. Growing up with and being employed in his father's logging road construction company instilled in him valuable skills that he uses on his job today.

PROFILE

CONTACT: Michigan Forest Products Council, michiganforest.com; JM Longyear, jmlongyear.com; Michigan Society of American Foresters, michigansaf.org; Northern Hardwood Lumber Mill, northernhardwoods.com; Great Lakes Timber Professionals, gltpa.org; NMU Earth, Environmental and Geographical Sciences Department, nmu.edu/eegs; NMU Biology Department, nmu.edu/biology.

Apprenticeship

GET PAID while
on the job training

Average
Earnings



\$16.80/hr.

(Plus benefits)
Training lasts 3 - 5 years

APPRENTICESHIP PROGRAMS AND THEIR LENGTH:

Boilermaker	4 years
Bricklayer	3 years
Carpenter	4 years
Electrician	5 years
Ironworker	3 years
Laborer	3 years
Millwright	4 years
Operator	3 years
Painter	4 years
Plumber/Pipefitter	5 years
Sheetmetal	4 years



PROFILE

APPRENTICESHIP PAYS

When you're accepted into a certified apprenticeship program, you receive classroom training from instructors with practical experience, plus you get paid while you're learning on the job. The average apprentice earns about \$35,000 per year during on-the-job training. Apprenticeship training lasts three to five years depending on the trade. Admission tests are required for most of the trades and candidates with high school courses in general math, algebra, geometry, science and mechanical drawing are the most desirable.

LEARN MORE

Boilermakers Local 169

Jim Calouette, Business Agent
10154 Highway M-35, Gladstone
906-428-2800 • jimc@boilermakerslocal169.com

Bricklayers & Allied Craftworkers Local 2

John Kleiber, Business Representative
119 South Front Street, Marquette
906-226-3015 • john.kleiber@bricklayers.org

International Brotherhood of Electrical Workers Local 906

Tom Hogan, Business Manager/Financial Secretary
119 South Front Street, Marquette
906-226-7497 • ibewlu1070@gmail.com

Ironworkers Local 8

TIm Roman, Business Representative
119 South Front Street, Marquette
906-228-6450 • tromaniwl8@gmail.com

Laborers Local 1329

Gene Alessandrini, Jr., Secretary-Treasurer/Field Rep.
1800 North Stephenson Avenue,
Iron Mountain
906-774-6070 • alessandrinijr@gmail.com

Michigan Regional Council of Carpenters/Millwrights Local 1510

Brian Kerrigan, Business Representative
1221 Division Street, Marquette
906-228-2913 • brian.kerrigan@hammer9.com

Michigan Regional Council of Carpenters/Millwrights Local 1510

1219 First Avenue South, Escanaba
906-789-1670

Operating Engineers Local 324

George Edwardsen, Business Representative
500 Hulet Drive, Bloomfield Township
248-451-0324 • george.edwardsen@iuoe324.org

Painters & Allied Trades Local 1011

Travis Cary, Business Agent
116 South Ninth Street, Escanaba
906-399-9797 • travis.dc26fti@live.com

Sheetmetal Workers Local 7

Ryan Stern, Business Agent
1500 West Washington Street, Suite 7, Marquette
906-225-0585 • rsternsmw7@gmail.com

U.A. Plumbers & Pipefitters Local 111

Mike Hares, Business Agent & Manager
2601 North 30th Street, Escanaba
906-789-9784 • mhares@ua111.com

U.A. Plumbers & Pipefitters Local 111

Dean Gutzman, Business Manager
119 South Front Street, Marquette
906-226-6511 • dgutzman@ua111.com

"I would highly recommend the trades as a career option to anyone who enjoys a challenge, including women who may be considering this field.

This is a career field for those who appreciate the idea of doing something different every day and who don't mind getting a little dirty.

And it's for those who want to push themselves to be stronger in both their personal and professional lives."

SARAH KOSSOW
LOCAL 1510, MICHIGAN REGIONAL COUNCIL OF
CARPENTERS/MILLWRIGHTS
2015 UPPER PENINSULA APPRENTICE OF THE
YEAR

Contact: Upper Peninsula Construction Council at 906-786-1573 upconstruction.com/jobs, or the unions listed at left that provide apprenticeship training.

SEE YOURSELF...



WHY A CAREER IN SKILLED TRADES?

- Demand: Career paths are in high demand as baby boomers near retirement and new jobs are created
- Education: Affordable and shorter certificate and associates degree programs are available
- Wages: Earn a family sustaining wage working in the trades
- Satisfaction: Work with your hands in a fulfilling career here in the Upper Peninsula

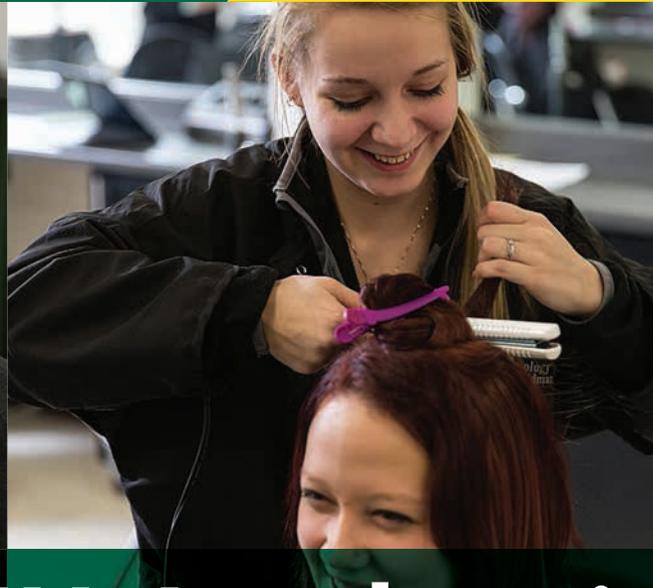
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PURE  MICHIGAN®

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NORTHERN MICHIGAN UNIVERSITY



ALERT!
SKILLED TRADES
CAMPS FOR KIDS

Summer 2016
nmu.edu/ce

NMU Jacobetti Complex OPEN HOUSE

WEDNESDAY, FEBRUARY 10
4:30 - 6:30 P.M.

ENTER TO WIN A \$500 NMU SCHOLARSHIP!

Learn it in the classroom.

Apply it with today's
tools and technology.

Land a great job.

Tour our learning labs. Meet with
faculty and current students to
discuss programs and
career choices.

- Automotive Service Technology
- Aviation Maintenance Technology
- Building Technology
- Computer Numerical Control Technology
- Construction Management
- Cosmetology
- Electrical Engineering Technology
- Electrical Line Technician
- Electrical Power Technician
- Electrical Technology
- Electronics Engineering Technology
- Engineering Design

- General Electronics
- Heating, Ventilation, Air Conditioning and Refrigeration (HVACR)
- Hospitality and Tourism Management
- Hospitality Management / Culinary
- Industrial Electrical
- Industrial Maintenance Technology
- Industrial Technologies
- Industrial Technologies Education
- Manufacturing Production Technician
- Mechanical Engineering Technology
- Regional Police Academy
- Welding Certificate

906-227-2190 • nmu.edu/tos • nmu.edu/engineeringtechnology