

## PROGRAM INFORMATION

<b>Academic Year</b>	2024 - 2025
<b>Credential</b>	College Certificate
<b>Program Delivery</b>	Full - Time
<b>Duration</b>	1 year
<b>Length</b>	2 Semesters
<b>Program Code</b>	T094 (PC) – Timmins Campus

## DESCRIPTION

Help keep industry up and running.

A millwright is vital to the operation of any industrial process. And with Northern's one-year **Mechanical Techniques – Industrial Millwright** certificate, you'll gain real-world experience in the installation, repair and maintenance of the complex machinery that literally runs our economy.

In an apprenticeship environment focused on teamwork, personal safety and problem solving, you'll be trained to meet the challenges of today's increasingly complex work environments. You'll develop high standards of craftsmanship, gain pride in your trade, and – along the way – learn to repair everything from pumps and presses, to conveyers, generators, and tanks.

The result is that you'll graduate with your level one of the in-school training for the apprenticeship requirements and be ready to claim your place in a wide range of industries. Or stay on with us for an extra year to earn a full diploma in our Mechanical Technician – Industrial Millwright program to complete all three levels of the in-school apprenticeship requirements and make you all the more employable in a fast-paced, lucrative and growing field.

## CAREER OPPORTUNITIES

Industrial Mechanics (Millwrights) work on industrial machinery and mechanical equipment and components. This equipment may include mechanical, pneumatic, hydraulic, fuel, lubrication, cooling, and exhaust systems. Some of the components they work on include pumps, fans, tanks, conveyors, presses, generators, and pneumatic and hydraulic controls.

Graduates may work in industries such as Aerospace, Automobile Assembly & Supply, Breweries, Food Processing, Mechanical Construction, Metal Fabrication, Mining & Forest Products, Nuclear & Fossil Power Stations, Pharmaceutical, Pulp & Paper, Steel Production, Wholesale Trading and more.

## VOCATIONAL LEARNING OUTCOMES

1. Complete all work in compliance with current legislation, standards, regulations and guidelines.
2. Contribute to the application of quality control and quality assurance procedures to meet organizational standards and requirements.
3. Comply with current health and safety legislation, as well as organizational practices and procedures.
4. Support sustainability best practices in workplaces.

5. Use current and emerging technologies to support the implementation of mechanical and manufacturing projects.
6. Troubleshoot and solve standard mechanical problems by applying mathematics and fundamentals of mechanics.
7. Contribute to the interpretation and preparation of mechanical drawings and other related technical documents.
8. Perform routine technical measurements accurately using appropriate instruments and equipment.
9. Assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications. Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

## PROGRAM COURSES

The following reflects the planned course sequence for full-time offerings of the program. Programs at Northern College are delivered using a variety of instruction modes. Courses may be offered in the classroom or lab, entirely online, or in a hybrid mode which combines classroom sessions with virtual learning activities.

<b>Semester 1</b>		<b>Hours</b>
EL1102	Electrical & Electronics Fundamentals	28
EN1592	Communication Fundamentals	28
GN1033	Health and Safety	42
GN1443	Indigenous Culture and Awareness	42
MA1002	Mathematics & Precision Measurement I	28
MM1002	Millwright Machining I	28
MM1004	Technical Drawings 1	56
MM3003	Industrial Indoctrination	42
WE1092	Welding I	25
 <b>Semester 2</b>		
EN1582	Applied Communications I	28
HD2003	Fluid Power I	42
MA2022	Mathematics & Precision Measurement II	28
MM1246	Bearings, Seals and Lubrication	70
MM1251	Power Transmission Systems	70
MM1275	Millwright Machining II	28
MM2004	Technical Drawings II	56
WE2092	Welding II	28

## PROGRAM PROGRESSION

The following reflects the planned progression for full-time offerings of the program.

### Fall Intake

- Sem 1: Fall 2024
- Sem 2: Winter 2025

## WORK INTEGRATED LEARNING OPPORTUNITIES

N/A

## ARTICULATION/TRANSFER AGREEMENTS

A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program coordinator for specific details if you are interested in pursuing such an option. Additional information can be found at [Articulation Agreements](#).

## ADDITIONAL INFORMATION

N/A

## PROGRAM SPECIFIC REQUIREMENTS

N/A

## ADMISSION REQUIREMENTS

- Ontario Secondary School Diploma (OSSD)
- Grade 12 English (C, U)
- Grade 11 Math (C, M, U)
- Or equivalent

Academic prerequisites for this program may be obtained free of charge through [Academic Upgrading](#). Applicants who do not have a high school diploma or equivalent and will have reached the age of 19 years on or before the start of the program must undergo academic testing and may be required to complete [Prior Learning Assessment & Recognition \(PLAR\)](#) process to demonstrate equivalency of admission requirements prior to admission into a program. For more details, please contact the Admissions Office at 705-235-7222 or [admissions@northern.on.ca](mailto:admissions@northern.on.ca).

### Additional Requirements for International Students

In addition to the general admission requirements, international students must have proof of English Proficiency and meet the requirements below.

1. Proof of Senior High School Diploma/Certificate
2. English Proficiency (we will require one of the following):
  - IELTS Academic International English Language Testing System: a minimum overall score of 6.0 must be achieved with no individual band score under 6.0; however, we will accept one band at 5.5.
  - TOEFL (Test of English as a Foreign Language) – Internet Based Test (iBT) overall minimum score of 79

- PTE (Pearson Test of English) Academic – Graduate Diploma: 58+

If your country of citizenship has English as its official language, we may accept alternate proof of English Proficiency. All educational documents must be submitted in English and will be dependent on the country of citizenship. For more information, please contact [admissions@northern.on.ca](mailto:admissions@northern.on.ca).

## GRADUATION REQUIREMENTS

- 13 Program Courses
- 2 Communications Courses
- 2 General Education Courses

## GRADUATION ELIGIBILITY

To graduate from this program, a student must attain a minimum of 60% or a letter grade of CR (Credit) in each course in each semester unless otherwise stated on the course outline. Students should consult departmental policies and manuals for additional detail and exceptions.

## GRADUATION WINDOW

Students unable to adhere to the program duration of two years (as stated above) may take a maximum of four years to complete their credential. After this time, students must be re-admitted into the program, and follow the curriculum in place at the time of re-admission.

## CONTACT INFORMATION

For questions about being admitted into the program, please contact Northern College Admissions at [admissions@northern.on.ca](mailto:admissions@northern.on.ca) or by phone at 705-235-3211 ext. 7222. For questions about the content of the program, contact the Program Coordinator.

Paul Gasparetto, Program Coordinator  
Tel: 705-235-3211 ext. 2181  
Email: [gasparettop@northern.on.ca](mailto:gasparettop@northern.on.ca)

## COURSE DESCRIPTIONS

### Semester 1

#### **EL1102 Electrical & Electronics Fundamentals**

To develop the apprentice's basic knowledge of electrical and electronic theory, we start with basic safety procedures demonstrating good habits while working around electrical equipment. We cover ohm's law; basic series and parallel circuits calculation and design and the use of various measuring electrical instruments as it applies in the field of Industrial Mechanic – Millwright trade. Labs will be assigned to reinforce the theory taught during the semester.

#### **EN1592 Communication Fundamentals**

A required course in the first semester of the Mechanical Techniques - Industrial Millwright, Motive Power Technician - Automotive Service, and Heavy Equipment Techniques programs at Northern College, Communication Fundamentals will provide students with an opportunity to reinforce their use of Standard English, develop their abilities to communicate effectively in the workplace and improve their capabilities with computer technology, particularly in using Word, Excel and Alldatapro to produce accurate and professional documents. As well, students will be required to use information technology like Blackboard and their own computing devices to research information online to learn about their trade pathway, find technical information using an industry system like Alldatapro, and to complete course assignments.

#### **GN1033 Health and Safety**

This course introduces the student to health and safety in their home, in society and within an occupational setting. Students learn about the social and personal benefits of safe work practices and the methods to best prevent accidents or injuries. Students will review the role, rights and responsibilities of an individual in today's health and safety conscious world. Students also learn how to read and interpret the Occupational Act and Regulations.

#### **GN1443 Indigenous Culture and Awareness**

This general education course will provide students with an introduction to Canadian Indigenous Nations' history, sovereignty, land titles, cultural history and current critical issues. Topics addressed include the content of Indigenous rights, economic and social development, community and political processes, and business law and policies, justice & social services. Canadian Indigenous History and Relations is a general education course that has been incorporated into all programs at Northern College.

#### **MA1002 Mathematics & Precision Measurement I**

Students will learn the basic mathematics and measuring instruments needed in the repair trade for mechanics and will relate the basic math for measuring and problem solving in repair and maintenance.

#### **MM1002 Millwright Machining I**

This course will develop the knowledge of ferrous and non-ferrous metals, alloys and non-metallic materials, thread systems for specific applications; select and install nuts, bolts, screws, dowels required to specifications, heat treat and stress relieve material if required.

## **MM1004 Technical Drawings 1**

The course will enable the student to interpret commonly used technical drawings and familiarize them with information typically found in manufacturing manuals. It will enable them to determine specifications, and identify drawing symbols, as well as draw and sketch using orthographic, isometric and sectional views. There will be an introduction to schematic symbols and logic and flow diagrams to prepare them for later courses in electrical and fluid power.

## **MM3003 Industrial Indoctrination**

This course will enable the student to protect self and others; comply with safety legislation under the Occupational Health and Safety Act, Workplace Hazardous Materials Information System (WHMIS); wear and maintain safety clothing and equipment; report all hazards; apply confined space safety procedures; apply machinery and equipment lock-out procedures; use correct body mechanics when lifting loads; communicate with fellow workers; report all accidents and respond to emergency situations. In addition, the student will be able to plan lifts; perform calculations using load charts; estimate load weights; select and use correct rigging/hoisting equipment; inspect and maintain rigging/hoisting equipment; use hand signals; control, balance and direct loads; disassemble all equipment safely.

## **WE1092 Welding I**

This course is designed to assist beginning students with the basic principles of welding. The emphasis is placed on practical applications and to assist the student in developing more advanced skills. The course content will be shared between shop and classroom time at the discretion of the professor.

## **Semester 2**

### **EN1582 Applied Communications I**

This course is required in the second semester of the Motive Power Technician – Automotive Service, Heavy Equipment Techniques, Motive Power Technician – Heavy Equipment and Mechanical Technician and Techniques – Industrial Millwright and Mechanical Technician – Welding Fitter trades programs at Northern College. The purpose of this course is to give students an opportunity to develop and enhance basic communication skills as required in the workplace. Students will also be required to use a computer to complete assignments and other course work, work independently and collaboratively, follow instructions and complete assigned tasks on time.

### **HD2003 Fluid Power I**

Students will learn the basic fundamentals of hydraulic systems and their components, as well as testing procedures and design differences.

### **MA2022 Mathematics & Precision Measurement II**

The mathematics course for Mechanical Techniques – Industrial Millwright, Motive Power Technician – Automotive Service and the Heavy Equipment Techniques consists of trade related mathematical problems and their solutions.

### **MM1246 Bearings, Seals and Lubrication**

This course will enable the student to identify and apply bearing materials, fits and tolerances, fit and maintain plain, journal, sleeve, radial and axial bearings, install and maintain bearing housings, fit and maintain anti-friction axial, radial, ball, roller, needle, taper and spherical bearings, inspect and lubricate bearings, fit and

maintain gasket, labyrinth, and mechanical seals, fit and maintain “O” ring and lip seals, select, install and remove packing, ensure that maintenance and installation procedures are to be prescribed standards.

### **MM1251 Power Transmission Systems**

This course will enable the student to install and maintain power transmission systems, perform trade calculations on horsepower, torque, speed ratios, install and align belts, V- belts, and pulleys, chain drives and sprockets. They will install, align and perform maintenance functions on shafts, speed reducers, gears, brakes, clutches and drives. They will demonstrate the correct use of keys, splines and bushings, to ensure installation and maintenance to specifications.

### **MM1275 Millwright Machining II**

This course will develop the theories and practices taught during MM1002 while furthering their knowledge on conventional machine tools such as engine lathes, drilling machines, saws, pedestal grinders and various hand tools. They will learn the parts, various operations, cutting tools and the relationship of speeds and feeds applied to milling machines. They will manufacture parts to specified tolerances which reflect field operations.

### **MM2004 – Technical Drawings II**

This is an introductory course designed to teach students the basics of using the AutoCAD drafting software to create 2 dimensional drawings. Lessons include using the draw, modify, layering and annotation commands.

### **WE2092 Welding II**

This course is designed to assist beginning students with the basic principles of welding. The emphasis is placed on practical applications and to assist the student in developing more advanced skills. The course content will be shared between shop and classroom time at the discretion of the professor.