

PROGRAM INFORMATION

Academic Year	2024 - 2025
Credential	Ontario College Diploma
Program Delivery	Full - Time
Duration	2 years
Length	4 Semesters
Program Codes	T110 (PC) - Timmins Campus

DESCRIPTION

Turn your love of motors and machines into a satisfying and lucrative career thanks to Northern's Motive Power Technician – Automotive Service diploma. The Automotive Service Technician is part of the Interprovincial Red Seal Program – the national standard for the trade across Canada.

This two-year hands-on program will lay the foundation you need to keep vehicles on the road. Not only will you earn a college diploma, but you will also receive credit for all three levels of the apprenticeship in-school training. This means that once you graduate from Northern College and secure an apprenticeship, you are not required to take time off work to complete the theoretical training, which is typically 3 eight-week blocks over three years. Many employers prefer diploma program graduates, as these apprentices do not need to be released for the mandatory apprenticeship training. Shop owners get to keep growing their business and you get to keep working!

This program also incorporates a 10-Week Placement which provides a valuable opportunity for you to experience a workplace setting firsthand while providing a realistic and practical method of career education. The placement can be viewed as a detailed practical job interview, which may result in a permanent full-time apprenticeship.

An Automotive Service Technician performs preventative maintenance, diagnoses problems and repairs vehicle systems in cars and light trucks. Specifically, they diagnose and repair:

- engines, transmissions, clutches, rear ends, differentials, brakes, drive shafts and axles
- suspension systems, including wheel alignment and steering systems
- ignition, charging and starting systems, wiring and other electrical/electronic systems
- fuel and engine management systems
- air-conditioning and heating systems

CAREER OPPORTUNITIES

Graduates of this program may find employment in the motor vehicle industry as a trainee or as an apprentice mechanic. Graduates may also work as a technical service advisor, service manager, parts/salesperson, or an insurance adjuster.

- Automotive service technician
- Employed by motor vehicle dealers, garages, truck and trailer dealerships, fleet maintenance companies, service stations, automotive specialty shops, and retail establishments with automotive service shops.

VOCATIONAL LEARNING OUTCOMES

1. Analyze, diagnose, and solve various motive power system problems by using problem-solving and critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships.
2. Diagnose and repair climate control systems in compliance with manufacturers' recommendations.
3. Diagnose and repair engine systems in compliance with manufacturers' recommendations.
4. Diagnose and repair electrical, electronic, personal safety, and emission components and systems in compliance with manufacturers' recommendations.
5. Diagnose and repair drive train components and systems in compliance with manufacturers' recommendations.
6. Diagnose and repair suspension, steering, and brake components and systems in compliance with manufacturers' recommendations.
7. Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.
8. Select and use a variety of troubleshooting techniques and test equipment to assess electronic circuits, vehicle systems, and subsystems.
9. Apply knowledge of hydraulics and pneumatics to the testing and analysis of motive power systems and subsystems.
10. Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.
11. Use information technology and computer skills to support work in a motive power environment.
12. Prepare, support, maintain, and communicate data from log, record, and documentation systems.
13. Apply business practices, project management skills, and communication skills to improve customer service.
14. Assist in quality-control and quality-assurance programs and procedures.
15. Develop and use personal and professional strategies and plans to improve professional growth, job performance, and work relationships.
16. Complete all assigned work in compliance with occupational, health, safety, and environmental law; established policies and procedures; codes and regulations; and in accordance with ethical principles

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.

Semester 1		Hours
EL1143	Electrical & Electronics I	42
EN1592	Communication Fundamentals	28
GN1033	Health and Safety	42
IN1092	Computer Methods Trades Software	28
MA1002	Mathematics & Precision Measurement I	28
MP1004	Trades Practices	56
MP1015	Drive Train Systems I	70
WE1092	Welding I	28
Semester 2		
EN1582	Applied Communications I	28
GN1443	Indigenous Culture and Awareness	42
MA2022	Mathematics & Precision Measurement II	28
MP1005	Engines I	70
MP2003	Motive Power Electrical II	42
MP2014	Air Intake, Exhaust and Fuel Systems	56
MP2025	Steering, Suspension and Brakes I	70
Semester 3		
General Education Elective		42
MP2015	Engines II	70
MP3014	Steering, Suspension and Brakes II	56
MP3033	Motive Power Electrical III	42
MP3053	Fuels II	42
MP3044	HVAC	56
Semester 4		
BU4073	Entrepreneurship	42
General Education Elective		42
MP2011	Motive Power-Automotive Placement	15
MP3025	Drive Train Systems II	70
MP4003	Motive Power Electrical IV	42

PROGRAM PROGRESSION

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

Sem 1: Fall 2024

Sem 2: Winter 2025

Sem 3: Fall 2025
Sem 4: Winter 2026

WORK INTEGRATED LEARNING OPPORTUNITIES

This program incorporates a 10-Week Placement which provides a valuable opportunity for you to experience a workplace setting firsthand while providing a realistic and practical method of career education. The placement is scheduled in Semester 4, includes 2 weeks of in-class exercises, and 20 full days of placement at a motor vehicle inspection station.

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.

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+
3. CO-OP Work Permit is mandatory for this program to participate in unpaid program placements.

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.

GRADUATION REQUIREMENTS

- 20 Program Courses
- 2 Communications Courses
- 4 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 or by phone at 705-235-3211 ext. 7222. For questions about the content of the program, contact the Program Coordinator.

Matt Dupuis, Program Coordinator
Tel: 705-235-3211 ext. 2196
Email: dupuism@northern.on.ca

COURSE DESCRIPTIONS

Semester 1

EL1143 Electrical & Electronics I

Students learn the fundamentals of DC electrical and electronic systems, using problem solving techniques and circuit board testing. Topics include basic electrical and electronic theory, problem solving using Ohm's Law and use of Digital Multimeters.

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.

IN1092 Computer Methods Trades Software

This course introduces students to careers in the motive power sector. Students will also use various service information systems required to successfully inspect, test and repair motive power vehicles. Students will access online service information to create work orders, research motive power system operations, identify component locations and electrical diagrams, and locate service information to aid in diagnostics and repairs.

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.

MP1004 Trade Practices and Applications Motive Power

Topics include shop safety and safe working habits, proper vehicle lifting practices, hand, shop and power tool identification and selection, use of precision tools, learn about fasteners, torque, bearing and seals. The students will put into practice what they have studied in theory class.

MP1015 Drive Train Systems I

This course is designed to give students an understanding of how the power from the engine reaches the vehicles drive wheels. Students will be able to explain the purpose and function of the clutch assembly, manual transmissions, drive and axle shafts, and single reduction final drives and differentials. Students will also be

able to inspect, diagnose and recommend repair procedures on the clutch, transmission, and drive axle assembly.

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.

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.

MA2022 Mathematics & Precision Measurement II

This course continues the development of knowledge and skills required to achieve success in the motive power industry. Students will review precision measurement and percent applications, as well as learn about ratios and proportions, geometry, and graphing.

MP1005 Engines I

This course is designed to provide students with a fundamental understanding of the operating principles, types, and designs of the modern internal combustion engine. Students will be able to explain how the engine produces torque and identify short block and cylinder head components. Students will have the opportunity to practice the skills learned using special tools and measuring instruments in the practical section of the course.

MP2003 Motive Power Electrical II

This course continues the development of knowledge and skills required to maintain and diagnose motive power electrical systems. The subjects of study include the following systems: electromagnetic devices, wiring and wire repairs, advanced circuit diagnosis, electrical schematics, flooded batteries, and starter motors. The students will have the opportunity to identify and describe systems, demonstrate the use of diagnostic tools, and recognize and solve problems using a strategy-based approach.

MP2014 Air Intake, Exhaust and Fuel Systems

This course introduces the different types and classifications of gasoline and diesel engines, the basic operation of the two- and four-stroke cycle engines, the different types of automotive fuels and their properties, intake and exhaust systems used on motor vehicles, and components of the electronic fuel injection and emission control systems. The students will have the opportunity to identify and describe systems, and develop the knowledge and skills required to maintain motive power fuel and emission systems. Additionally, the students will have the ability to explain the purpose, operation and safe working practices associated with hybrid vehicles.

MP2025 Steering, Suspension and Brake Systems I

Students are introduced to motive power type steering, suspension, and braking systems. The subjects of study include the fundamentals of steering systems and components, tires, wheels, hubs, and hydraulic braking systems. Students will have the opportunity to practice the skills learned in the practical section of the course.

Semester 3

General Education Elective

General Education Courses are selected online each semester by the student from a list provided and exposes students to a related area of study outside of their immediate academic discipline. Certain programs have predetermined electives.

MP2015 Engines II

Students are introduced to the basic construction of internal combustion engines, and will learn the proper maintenance, cleaning, inspection and overhaul procedures of gasoline engines and components. Topics will include the construction and repair of valve trains and camshafts, cylinder heads, engine testing and start-up procedures and engine component failure analysis.

MP3014 Steering, Suspension and Brakes II

This course continues to provide experience with the diagnosis and repair of automotive steering, suspension, and brake systems. Students will learn about component replacement, wheel alignment and hydraulic brake system servicing. Students will also be introduced to electronic systems such as: ABS, Traction Control and Electronic Steering and Suspension systems.

MP3033 Motive Power Electrical III

This course continues the development of knowledge and skills required to maintain and diagnose motive power electrical systems. The subjects of study include the following systems: electronics and electrical accessories such as lights, instrumentation, horns, wipers, and blower motors. This course also includes the fundamentals, operation, testing and repair of charging systems. The students will have the opportunity to identify and describe systems, demonstrate the use of diagnostic tools, and recognize and solve problems using a strategy-based approach.

MP3053 Fuels II

This course continues the development of knowledge and skills required to maintain and diagnose advanced vehicle fuel and emission systems. The subjects of study include the following: vehicle on-board control modules, scan tool functions, Diagnostic Trouble Code and EFI systems diagnosis, and the diagnosis and

repair of emissions control systems, including: EGR valves, catalytic converters and EVAP systems. The students will have the opportunity to identify and describe systems, demonstrate the use of diagnostic tools, and recognize and solve problems using a strategy-based approach. Additionally, the students will have the ability to explain the purpose, construction, principles of operation, inspection and testing for diesel fuel systems.

MP3044 HVAC

This course is designed to provide the student with practical experience in diagnosis and repair of heating and air conditioning systems. Also, the successful student will earn ODP Certification for the purchasing and/or handling of refrigerants throughout Canada, to fulfill provincial and federal regulations.

Semester 4

BU4073 Entrepreneurship

This course introduces students to the nature of business and entrepreneurship. Students will obtain an overview of entrepreneurship and the entrepreneurial process then expand into key concepts including business types, customers, marketing, financials, and human resources. The options of franchising and purchasing existing businesses are also covered in this course. Students will outline and assess the components of a Business Plan.

General Education Elective

General Education Courses are selected online each semester by the student from a list provided and exposes students to a related area of study outside of their immediate academic discipline. Certain programs have predetermined electives.

MP2011 Motive Power-Automotive Placement

The Motive Power Automotive Placement provides a valuable opportunity for students to experience a workplace setting firsthand while providing a realistic and practical method of career education. The placement allows students to practice theoretical knowledge and skills learned in the classroom and Lab and to develop practical job required skills. Placement helps orient the student in their chosen field, and results in a well-developed career plan before graduation.

MP3025 Drive Trains II

This course continues the development of knowledge and skills required to maintain and diagnose transmissions and transaxles. Specifically, this course focuses on the fundamentals, the operation and the repair of automatic transmissions and transaxles. The students will have the opportunity to describe systems, explain and demonstrate on-vehicle and component maintenance and repair. Practical elements include service, diagnosis, teardown, inspection, and reassembly of an automatic transmission.

MP4003 Motive Power Electrical IV

This course continues the development of knowledge and skills required to maintain and diagnose advanced vehicle electrical systems. The subjects of study include the following systems: ignition, vehicle communication, supplemental inflatable restraint and anti-theft. The students will have the opportunity to identify and describe systems, demonstrate the use of diagnostic tools, and recognize and solve problems using a strategy-based approach. Additionally, the students will have the ability to explain the principles of operation of electrical drive and regenerative braking systems associated with hybrid vehicles.