



# Motive Power Fundamental Program Standard

The approved program standard for Motive Power Fundamental programs of instruction leading to an Ontario College Certificate delivered by Ontario Colleges of Applied Arts and Technology.

(MTCU funding code 46405)

Ministry of Colleges and Universities  
January 2025

## **Acknowledgements**

The Ministry of Colleges and Universities acknowledges with thanks the significant contribution of the many individuals and organizations which participated in the development of this program standard. In particular, the Ministry of Colleges and Universities would like to acknowledge the important roles of:

- all individuals and organizations which participated in the consultations
- the faculty, coordinators and deans of the Motive Power Fundamental (Ontario College Certificate) programs for their assistance throughout the project
- Noor Jehan Kabani, the Project Officer who led the English review
- Isabel Bellon, the Project Officer who led the French review.

## Table of contents

Introduction	4
Development of system-wide program standards	4
Program standards	4
The expression of program standards as vocational learning outcomes	5
The presentation of the vocational learning outcomes	5
The development of a program standard	5
Updating the program standard	6
Vocational standard	7
Preamble	7
The vocational learning outcomes	9
Essential employability skills	18
Context	18
Skill categories	18
Application and implementation	19
General education requirement	22
Requirement	22
Purpose	22
Themes	22

# Introduction

This document is the Program Standard for the Motive Power Fundamental programs of instruction leading to an Ontario College Certificate delivered by Ontario Colleges of Applied Arts and Technology (MTCU funding code 46405).

## Development of system-wide program standards

In 1993, the Government of Ontario initiated program standards development with the objectives of bringing a greater degree of consistency to college programming offered across the province, broadening the focus of college programs to ensure graduates have the skills to be flexible and to continue to learn and adapt, and providing public accountability for the quality and relevance of college programs.

The Program Standards Unit of the Ministry of Colleges and Universities has responsibility for the development, review and approval of system-wide standards for programs of instruction at Ontario Colleges of Applied Arts and Technology.

## Program standards

Program standards apply to all similar programs of instruction offered by Colleges of Applied Arts and Technology across the province of Ontario. Each program standard for a postsecondary program includes the following elements:

- [Vocational standard](#) (the vocationally specific learning outcomes which apply to the program of instruction in question)
- [Essential employability skills](#) (the essential employability skills learning outcomes which apply to all programs of instruction)
- [General education requirement](#) (the requirement for general education in postsecondary programs of instruction)

Collectively, these elements outline the essential skills and knowledge that a student must reliably demonstrate in order to graduate from the program.

Individual Colleges of Applied Arts and Technology offering the program of instruction determine the specific program structure, delivery methods and other curriculum matters to be used in assisting students to achieve the outcomes articulated in the standard. Individual colleges also determine whether additional local learning outcomes will be required to reflect specific local needs and/or interests.

## The expression of program standards as vocational learning outcomes

Vocational learning outcomes represent culminating demonstrations of learning and achievement. They are not simply a listing of discrete skills, nor broad statements of knowledge and comprehension. In addition, vocational learning outcomes are interrelated and cannot be viewed in isolation from one another. As such, they should be viewed as a comprehensive whole. They describe performances that demonstrate that significant integrated learning by graduates of the program has been achieved and verified.

Expressing standards as vocational learning outcomes ensures consistency in the outcomes for program graduates, while leaving to the discretion of individual colleges, curriculum matters such as the specific program structure and delivery methods.

## The presentation of the vocational learning outcomes

The **vocational learning outcome** statements set out the culminating demonstration of learning and achievement that the student must reliably demonstrate before graduation.

The **elements of the performance** for each outcome define and clarify the level and quality of performance necessary to meet the requirements of the vocational learning outcome. However, it is the performance of the vocational learning outcome itself on which students are evaluated. The elements of performance are indicators of the means by which the student may proceed to satisfactory performance of the vocational learning outcome. The elements of performance do not stand alone but rather in reference to the vocational learning outcome of which they form a part.

## The development of a program standard

In establishing the standards development initiative, the Government of Ontario determined that all postsecondary programs of instruction should include vocational skills coupled with a broader set of essential skills. This combination is considered critical to ensuring that college graduates have the skills required to be successful both upon graduation from the college program and throughout their working and personal lives.

A program standard is developed through a broad consultation process involving a range of stakeholders with a direct interest in the program area, including employers, professional associations, universities, secondary schools and program graduates working in the field, in addition to students, faculty and administrators at the colleges themselves. It represents a consensus of participating stakeholders on the essential learning that all program graduates should have achieved.

## Updating the program standard

The Ministry of Colleges and Universities will undertake regular reviews of the vocational learning outcomes for this program to ensure that the Motive Power Fundamental Program Standard remains appropriate and relevant to the needs of students and employers across the Province of Ontario. To confirm that this document is the most up-to-date release, please contact the [Ministry of Colleges and Universities](#).

# Vocational standard

All graduates of Motive Power Fundamental programs have achieved the [six vocational learning outcomes \(VLOs\)](#), in addition to achieving the essential employability outcomes and meeting the general education (GE) requirement.

## Preamble

The motive power field encompasses motive power operations systems that are driven from a variety of energy sources, such as gasoline, diesel, liquid petroleum gas, natural gas, other fuel, and propulsion including, but not limited to electric and hybrid systems.

Graduates of the Motive Power Fundamentals certificate program will have demonstrated achievement of vocational learning outcomes that include the essential skills, knowledge, and attitudes for entry level positions in specific motive power industries.

Achievement of the vocational learning outcomes will prepare the graduates of the Motive Power Fundamentals program to identify basic motive power system problems, to inspect and test basic motive power components and systems, and to use a variety of test equipment to support maintenance and repair. In addition, graduates will have developed safe working practices in the use of machinery, tools, and equipment. Graduates will be able to apply basic communication, documentation, information technology, and computer skills applicable to motive power environment.

Graduates of Motive Power Fundamentals programs may find entry level positions in a variety of employment settings in both large and small organizations, such as dealerships, service and repair shops, and retail stores. Their activities may include tire and lube technician, service assistant and parts/counter service.

Additional opportunities exist for graduates to pursue further educational qualification or occupational certification. Through apprenticeship or through articulation agreements between the colleges, graduates may be granted credits towards further education. Students should contact individual colleges for further details of potential articulation agreements or credit-transfer opportunities with other institutions, and professional associations for industry certification.

Note: The [Ontario Council on Articulation and Transfer](#) (ONCAT) maintains the provincial postsecondary credit transfer portal, [ONTransfer](#).

## Synopsis of the vocational learning outcomes Motive Power Fundamental (Ontario College Certificate)

The graduate has reliably demonstrated the ability to:

1. Identify the operation and routine maintenance procedures of components and sub-components to characterize motive power systems with different energy sources.
2. Disassemble and assemble components and sub-components to maintain, diagnose and repair motive power systems.
3. Test fundamental motive power systems to identify faults.
4. Use electronic service information to diagnose and plan motive power repairs or maintenance of motive power systems.
5. Document maintenance, inspection, and repair records for business and client records.
6. Perform all assigned work and safety procedures according to manufacturers' service information, applicable codes, and regulations.

Note: The learning outcomes have been numbered as a point of reference; numbering does not imply prioritization, sequencing, nor weighting of significance.



## **The vocational learning outcomes**

1. The graduate has reliably demonstrated the ability to: identify the operation and routine maintenance procedures of components and sub-components to characterize motive power systems with different energy sources.

### **Elements of the performance**

- a. Engine
  - i. identify different engine types and sizes used in motive power industry.
- b. Brakes
  - i. explain and identify, fundamental brake systems and components, construction, and operations.
  - ii. differentiate and characterize hydraulic brake system components and subassemblies.
  - iii. identify and specify air brake system components and subassemblies.
- c. Drivetrain
  - i. identify clutch systems and components and describe its operations.
  - ii. explain basic gear theory and operation.
  - iii. describe the operation of manual transmissions / transaxles.
  - iv. identify internal and external manual transmission/transaxle components.
- d. Suspension
  - i. classify and identify various suspension system designs.
  - ii. describe the purpose and operation of suspension system dampeners.
  - iii. describe the purpose and operation of suspension system springs.
  - iv. identify and describe the operation of various ball joint designs.
  - v. describe the design and function of various control arm designs.
- e. Steering
  - i. describe the operation of various steering linkage designs.
- f. Wheels and tires
  - i. describe the design and construction of tires.
  - ii. describe and identify various wheel rim designs.
  - iii. describe the operation of wheel and tire mounting and balancing equipment.
  - iv. describe the design and function of tire pressure monitoring systems.
- g. Fuel and alternate fuels
  - i. identify and describe gasoline fuel systems and list components.
  - ii. identify diesel fuels systems and components.
  - iii. identify and outline liquified petroleum gas fuel systems and component.
  - iv. describe natural gas fuel systems and components.
  - v. compare and contrast other alternate fuel systems and components.

- h. Emissions
  - i. identify intake and exhaust systems and components.
  - ii. identify and compare gasoline emission systems and components.
  - iii. identify diesel emission systems and components.
  - iv. identify and explain liquified petroleum gas emission systems and components.
  - v. identify and explain natural gas emission systems and components.
  - vi. identify and explain other alternate emission systems and components.
- i. Fluid power
  - i. classify and outline fluid power systems and components.
- j. Electrical and electronics
  - i. identify and describe the design and operation of battery, starting and charging systems.
  - ii. identify and describe various circuits designs and protection devices.
  - iii. describe the design and operation of various sensors and circuits.
  - iv. identify and describe the design and operation of various ignition systems and components.
  - v. identify and define fundamental electrical properties of voltage types, amperage and resistance.
  - vi. identify different types of locking mechanisms on wiring harness plugs and sensors.
- k. Alternate propulsion systems
  - i. identify and compare hybrid and electric vehicles systems and components.
  - ii. distinguish and explain drive motor component.
  - iii. identify and list appropriate personal protective equipment for working with various voltage systems following manufacturers recommendations.
- l. Body and structure
  - i. classify the body structure types in motive power industry.
  - ii. identify and describe subsystems within different body structure styles.
  - iii. describe manufacturing and assembly processes of different body structures.
  - iv. identify the tools and equipment required to repair body structure systems.

2. The graduate has reliably demonstrated the ability to: disassemble and assemble components and sub-components to maintain, diagnose and repair motive power systems.

### **Elements of the performance**

- a. Engine
  - i. measure engine components for wear or component failure.
  - ii. disassemble and assemble various:
    - engine short block designs and related components
    - cylinder head designs and related components
    - timing drive designs and related components
- b. Brakes
  - i. disassemble and assemble:
    - brake friction assemblies and components
    - power brake assist components
    - brake hydraulic components
    - brake pneumatic components
- c. Drivetrain
  - i. disassemble and assemble various:
    - manual transmission designs and components
    - automatic transmission designs and related components
    - clutch designs and related components
    - differential designs and related components
    - driveshaft and axle designs and related components
    - torque convertor designs
- d. Suspension
  - i. disassemble and assemble various wheel hub designs and related components
- e. Steering
  - i. disassemble and assemble various:
    - steering column designs and related components
    - steering gear designs and related components
    - power steering assist components
- f. Wheels and tires
  - i. disassemble and assemble wheel assemblies (tires and rims) and balance.
- g. Fuel and alternate fuels
  - i. disassemble and assemble:
    - fuel tanks and related components

- fuel rails and related components

#### h. Fluid Power

##### i. disassemble and assemble:

- hydraulic steering components
- hydraulic brake components
- heavy duty cylinders, motors, pumps, filters, accumulators, reservoirs (truck and coach only)

#### i. Electrical and electronics

##### i. disassemble and assemble starters, alternators, and related components.

#### j. Climate control

##### i. disassemble and assemble various:

- heating, ventilation and air conditioning box designs and related components
- air conditioning compressor designs and related components

#### k. Other

- select and use tools, equipment, and processes safely to remove, replace, and assemble components.
- install and remove fasteners according to manufacturer's specifications.
- install and remove fasteners and components during assembly and reassembly.
- utilize appropriate measuring devices for the purpose of disassembly and reassembly.
- use repair techniques such as drilling, tapping and thread repair where required for disassembly and reassembly.
- use heating and welding equipment as required for disassembly and reassembly.

3. The graduate has reliably demonstrated the ability to: test fundamental motive power systems to identify faults.

### **Elements of the performance**

- a. Engine
  - i. measure/evaluate engine components in accordance with manufacturer service specifications.
- b. Brakes
  - i. inspect, and replace brake lines
  - ii. inspect and recommend repairs for disc brake assemblies
  - iii. service disc brake assemblies
  - iv. inspect and recommend repairs for drum brake assemblies
  - v. service drum brake assemblies
- c. Drivetrain
  - i. apply diagnostic procedures to various clutch system designs
  - ii. adjust and/or replace clutch assemblies
  - iii. perform diagnostic procedures to manual transmissions/transaxles
  - iv. inspect and test components in different driveline configurations
- d. Suspension
  - i. inspect and test suspension system components and subassemblies
- e. Steering
  - i. inspect and test steering linkage components
- f. Wheels and tires
  - i. select and use diagnostic tools and equipment for wheel and tire assemblies
  - ii. inspect tires for wear and damage
  - iii. inspect wheel rims for damage and wear
  - iv. inspect wheel fasteners and mounting systems
  - v. inspect and test tire pressure monitoring systems and components
- g. Fuel and alternate fuels
  - i. inspect and test gasoline fuel, diesel, liquid petroleum gas, natural gas and/or other fuel systems and components
- h. Emissions
  - i. inspect and test gasoline, diesel, liquid petroleum gas, natural gas, and/or other emission components
  - ii. inspect intake and exhaust systems
- i. Fluid power
  - i. inspect and test the operation of fluid systems

- ii. inspect motive power systems that utilize hydraulic and pneumatic principles.
- j. Electrical and electronics
  - i. inspect, test, and recommend repairs for the following electrical and electronic systems and components:
    - batteries.
    - circuits and circuit protection devices

4. The graduate has reliably demonstrated the ability to: use electronic service information to diagnose and plan motive power repairs or maintenance of motive power systems.

### **Elements of the performance**

- a. retrieve and interpret electronic schematics for the purpose of diagnosing system and circuit faults.
- b. utilize diagnostic flow charts to address faults.
- c. select and apply electronic service information to repair procedures.
- d. analyze descriptions and operations in electronic service information for diagnosis and repair.
- e. locate and utilize specifications required to repair and maintain motive power systems.
- f. locate and follow manufacturer's maintenance schedules.
- g. locate and interpret recalls and technical service bulletins for the purpose of diagnosis and repairs.
- h. locate and utilize labour time guides for the purpose of estimating costs and repair times.
- i. utilize electronic parts catalogues for the purpose of estimating repair costs and inventory control.

5. The graduate has reliably demonstrated the ability to: document maintenance, inspection, and repair records for business and client records.

### **Elements of the performance**

- a. prepare and complete sample workorders to document customer complaint, cause, and recommended correction of system problems.
- b. list parts used to correct system problems.
- c. record and enter information and data using applicable software and/or paper-based forms.
- d. inspect the vehicle and check all items listed on the pre-delivery inspection forms.
- e. complete vehicle inspection forms for preventative maintenance and report repair requirements.
- f. use industry terminology for parts, components, and operations in record keeping.



6. The graduate has reliably demonstrated the ability to: perform all assigned work and safety procedures according to manufacturers' service information, applicable codes, and regulations.

### **Elements of the performance**

- a. perform safe moving and repositioning of large/heavy vehicles and equipment.
- b. describe environmental, health and safety legislation, codes, and regulations.
- c. describe human rights and employment standards within the scope of the motive power industry.
- d. interpret applicable requirements and standards for the purpose of vehicle inspections in the motive power industry.
- e. describe the environmental and ecological sustainability in the context of motive power industry.
- f. utilize and maintain appropriate personal protective equipment in accordance with current safety standards.
- g. identify regular certification cycles of personal protective equipment and service equipment.
- h. Identify and assess safety protocols of different voltage systems in motive power industry.
  - i. review safe working practices and personal protective equipment.
  - ii. safe high voltage system disabling and re-enabling [power down procedures].
  - iii. identifying main components in the high and low voltage systems.
  - iv. describe various voltage safety systems such as interlock and isolation resistance.
  - v. describe AC and DC electricity safety principles related to motive power systems.
  - vi. identify working voltage in various system to assess safety protocols.
  - vii. identify wiring harnesses, colour coding and components within different voltage systems.
  - viii. describe safe charging procedures for high voltage systems.
  - ix. describe proper auxiliary battery charging and boosting methods.
- i. locate and apply proper testing procedures based on manufacturers' current service information.

# Essential employability skills

All graduates of the Motive Power Fundamental program of instruction must have reliably demonstrated the essential employability skills learning outcomes listed below, in addition to achieving the [vocational learning outcomes](#) and meeting the [general education requirement](#).

## Context

Essential Employability Skills (EES) are skills that, regardless of a student's program or discipline, are critical for success in the workplace, in day-to-day living and for lifelong learning.

The teaching and attainment of these EES for students in, and graduates from, Ontario's Colleges of Applied Arts and Technology are anchored in a set of three fundamental assumptions:

- These skills are important for every adult to function successfully in society today.
- Our colleges are well equipped and well positioned to prepare graduates with these skills.
- These skills are equally valuable for all graduates, regardless of the level of their credential, whether they pursue a career path, or they pursue further education.

## Skill categories

To capture these skills, the following six categories define the essential areas where graduates must demonstrate skills and knowledge.

- Communication
- Numeracy
- Critical Thinking and Problem Solving
- Information Management
- Interpersonal
- Personal

# Application and implementation

In each of the six skill categories, there are a number of defining skills, or sub skills, identified to further articulate the requisite skills identified in the main skill categories. The following chart illustrates the relationship between the skill categories, the defining skills within the categories and learning outcomes to be achieved by graduates from all postsecondary programs of instruction that lead to an Ontario College credential.

EES may be embedded in General Education or vocational courses or developed through discrete courses. However, these skills are developed, all graduates with Ontario College credentials must be able to reliably demonstrate the essential skills required in each of the six categories.

## **Skill category: communication**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- reading
- writing
- speaking
- listening
- presenting
- visual literacy

### **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken or visual messages in a manner that ensures effective communication.

## **Skill category: numeracy**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- understanding and applying mathematical concepts and reasoning
- analyzing and using numerical data
- conceptualizing

## **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Execute mathematical operations accurately.

## **Skill category: critical thinking and problem solving**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- analyzing
- synthesizing
- evaluating
- decision making
- creative and innovative thinking

## **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Apply a systematic approach to solve problems.
2. Use a variety of thinking skills to anticipate and solve problems.

## **Skill category: information management**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- gathering and managing information
- selecting and using appropriate tools and technology for a task or a project
- computer literacy
- Internet skills

## **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Locate, select, organize and document information using appropriate technology and information systems.
2. Analyze, evaluate and apply relevant information from a variety of sources.

## **Skill category: interpersonal**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- teamwork
- relationship management
- conflict resolution
- leadership
- networking

### **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Show respect for the diverse opinions, values, belief systems and contributions of others.
2. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.

## **Skill category: personal**

### **Defining skills**

Skill areas to be demonstrated by graduates:

- managing self
- managing change and being flexible and adaptable
- engaging in reflective practices
- demonstrating personal responsibility

### **Learning outcomes**

The graduate has reliably demonstrated the ability to:

1. Manage the use of time and other resources to complete projects.
2. Take responsibility for one's own actions, decisions and their consequences.

# General education requirement

All graduates of the Motive Power Fundamental program must have met the [general education requirement](#) described below, in addition to achieving the [vocational](#) and [essential employability skills](#) learning outcomes.

## Requirement

The [General Education Requirement](#) for programs of instruction is stipulated in the [Credentials Framework](#) in the Minister's Binding Policy Directive Framework for Programs of Instruction.

In programs of instruction leading to either an Ontario College Certificate or an Ontario College Advanced Certificate, it is required that graduates have been engaged in learning that exposes them to at least one discipline outside their main field of study and increases their awareness of the society and culture in which they live and work. This will typically be accomplished by students taking 3 to 5 courses (or the equivalent) designed discretely and separately from vocational learning opportunities.

This general education learning would normally be delivered using a combination of required and elective processes.

## Purpose

The purpose of General Education in the Ontario college system is to contribute to the development of citizens who are conscious of the diversity, complexity and richness of the human experience; who are able to establish meaning through this consciousness; and who, as a result, are able to contribute thoughtfully, creatively and positively to the society in which they live and work.

General Education strengthens students' essential employability skills, such as critical analysis, problem solving and communication, in the context of an exploration of topics with broad-based personal and/or societal importance.

## Themes

The themes listed below will be used to provide direction to Ontario Colleges in the development and identification of courses that are designed to fulfil the General Education Requirement for programs of instructions.

Each theme provides a statement of Rationale and offers suggestions related to more specific topic areas that could be explored within each area. These suggestions are neither prescriptive nor exhaustive. They are included to provide guidance regarding the nature and scope of content that would be judged as meeting the intent and overall

goals of General Education.

### **Arts in society:**

Rationale:

The capacity of a person to recognize and evaluate artistic and creative achievements is useful in many aspects of his/her life. Since artistic expression is a fundamentally human activity, which both reflects and anticipates developments in the larger culture, its study will enhance the student's cultural and self-awareness.

Content:

Courses in this area should provide students with an understanding of the importance of visual and creative arts in human affairs, of the artist's and writer's perceptions of the world and the means by which those perceptions are translated into the language of literature and artistic expression. They will also provide an appreciation of the aesthetic values used in examining works of art and possibly, a direct experience in expressing perceptions in an artistic medium.

### **Civic Life:**

Rationale:

In order for individuals to live responsibly and to reach their potential as individuals and as citizens of society, they need to understand the patterns of human relationships that underlie the orderly interactions of a society's various structural units. Informed people will have knowledge of the meaning of civic life in relation to diverse communities at the local, national and global level and an awareness of international issues and the effects of these on Canada, as well as Canada's place in the international community.

Content:

Courses in this area should provide students with an understanding of the meaning of freedoms, rights and participation in community and public life, in addition to a working knowledge of the structure and function of various levels of government (municipal, provincial, national) in a Canadian and/or in an international context. They may also provide an historical understanding of major political issues affecting relations between the various levels of government in Canada and their constituents.

### **Social and cultural understanding:**

Rationale:

Knowledge of the patterns and precedents of the past provide the means for a person to gain an awareness of his or her place in contemporary culture and society. In

addition to this awareness, students will acquire a sense of the main currents of their culture and that of other cultures over an extended period of time in order to link personal history to the broader study of culture.

Content:

Courses in this area are those that deal broadly with major social and cultural themes. These courses may also stress the nature and validity of historical evidence and the variety of historical interpretation of events. Courses will provide the students with a view and understanding of the impact of cultural, social, ethnic or linguistic characteristics.

### **Personal understanding:**

Rationale:

Educated people are equipped for life-long understanding and development of themselves as integrated physiological and psychological entities. They are aware of the ideal need to be fully functioning persons: mentally, physically, emotionally, socially, spiritually and vocationally.

Content:

Courses in this area will focus on understanding the individual: his or her evolution; situation; relationship with others; place in the environment and universe; achievements and problems; and his or her meaning and purpose. They will also allow students the opportunity to study institutionalized human social behaviour in a systematic way. Courses fulfilling this requirement may be oriented to the study of the individual within a variety of contexts.

### **Science and technology:**

Rationale:

Matter and energy are universal concepts in science, forming a basis for understanding the interactions that occur in living and non-living systems in our universe. Study in this area provides an understanding of the behaviour of matter that provides a foundation for further scientific study and the creation of broader understanding about natural phenomena.

Similarly, the various applications and developments in the area of technology have an increasing impact on all aspects of human endeavour and have numerous social, economic and philosophical implications. For example, the operation of computers to process data at high speed has invoked an interaction between machines and the



human mind that is unique in human history. This and other technological developments have a powerful impact on how we deal with many of the complex questions in our society.

#### Content:

Courses in this area should stress scientific inquiry and deal with basic or fundamental questions of science rather than applied ones. They may be formulated from traditional basic courses in such areas of study as biology, chemistry, physics, astronomy, geology or agriculture. As well, courses related to understanding the role and functions of computers (e.g., data management and information processing) and assorted computer-related technologies should be offered in a non-applied manner to provide students with an opportunity to explore the impact of these concepts and practices on their lives.

## Permission to reproduce

Permission is hereby granted to the following institutions to reproduce this document, in whole or in part, in print or by electronic means, for the following specific purposes, subject to the conditions that follow.

1. By an Ontario College of Applied Arts and Technology for the purposes of implementation of the program standard within a college program, including for the purpose of informing students, potential students, program advisory committees or others about programs of study.
2. By an educational institution or school, for the purpose of informing prospective college students about programs of study at Ontario Colleges of Applied Arts and Technology.

### Conditions:

1. Every reproduction must be marked “© 2025, King’s Printer for Ontario” at the beginning of the document or any part of it that is reproduced.
2. No other uses may be made of the document.
3. The document may not be reproduced for sale.
4. The Ministry may revoke the permission to reproduce at any time.

For permission to copy this document, in whole or in part, for other purposes or by other institutions, please contact:

Ministry of Colleges and Universities  
Postsecondary Education Quality Assessment Branch  
Program Standards Unit  
315 Front Street West  
15<sup>th</sup> floor  
Toronto, Ontario  
M7A 0B8

Or by email: [psu@ontario.ca](mailto:psu@ontario.ca)

Inquiries regarding specific Motive Power Fundamental programs offered by Colleges of Applied Arts and Technology in Ontario should be directed to the relevant college.

This publication is available on the [ministry’s website](#).

© 2025, King's Printer for Ontario

978-1-4868-8329-5 PDF