Ontario

Motive Power Fundamentals Program Standard

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

(MTCU funding code 46405)

Ministry of Training, Colleges and Universities
August 2003

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Inquiries regarding this program standard should be directed to the address noted above.

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Table of Contents

I. Introduction

This document is the Program Standard for all Motive Power Fundamentals 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 Colleges Branch of the Ministry of Training, 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 across the province. 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),
- **Generic employability skills standard** (the generic skills learning outcomes which apply to all programs of instruction offering similar credentials), and
- **General education standard** (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 Learning Outcomes

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, learning outcomes are interrelated and cannot be viewed in isolation of 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 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 Learning Outcomes

The **learning outcome** statement sets 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 learning outcome. However, it is the performance of the learning outcome itself on which students are evaluated. The elements are indicators of the means by which the student may proceed to satisfactory performance of the learning outcome. The elements do not stand alone but rather in reference to the learning outcome of which they form a part.

The Development of a Program Standard

In establishing the standards development initiative, the Government 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 Training, Colleges and Universities will undertake regular reviews of the vocational learning outcomes for this program to ensure that the Motive Power Fundamentals 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, contact the Ministry of Training, Colleges and Universities:

psu@ontario.ca

II. Vocational Standard

All graduates of Motive Power Fundamentals programs of instruction must have achieved the fourteen vocational learning outcomes listed in the following pages, in addition to achieving the generic employability skills learning outcomes and meeting the general education standard.

Preamble

The motive power field encompasses a variety of vehicle transportation. Graduates of the Motive Power Fundamentals Program have demonstrated achievement of vocational learning outcomes that include the essential skills, knowledge, and attitudes for entry-level positions in specific motive power environments.

Achievement of the vocational learning outcomes will prepare the graduates of the two-semester 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 vehicle transportation. In addition, graduates will have developed safe working practices in the use of machinery, tools, and equipment. Finally, graduates will be able to perform customer service functions; and to apply basic communication, documentation, information technology, and computer skills to support a motive power environment.

Graduates of Motive Power Fundamentals Programs work in a variety of employment settings in businesses in both large and small organizations, such as dealerships, service and repair shops, and retail stores. Their activities may include service writing, sales, parts/counter service, and customer relations. Graduates' learning would be significantly enhanced by opportunities for as much practical experience as is feasible during their time in the program.

There may be opportunities for graduates to pursue further educational or occupational qualifications; through apprenticeship or through articulation agreements between the colleges, graduates may be granted credits towards a diploma or other certification. Students should contact individual colleges for further details of a college's articulation agreements with other institutions.

Synopsis of the Vocational Learning Outcomes
Motive Power Fundamentals Programs

The graduate has reliably demonstrated the ability to

1. **identify basic motive power system problems by using critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships.**

2. **identify, inspect, and test basic engine components and systems in compliance with manufacturers' recommendations.**

3. **identify, inspect, and test basic electrical, electronic, and emission components and systems in compliance with manufacturers' recommendations.**

4. **identify, inspect, and test basic drive train components and systems in compliance with manufacturers' recommendations.**

5. **identify, inspect, and test basic suspension, steering, and brake components and systems in compliance with manufacturers' recommendations.**

6. **disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.**

7. **use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems.**

8. **apply basic knowledge of hydraulics and pneumatics to the testing and inspection of basic motive power systems and subsystems.**

9. **communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.**

10. **use information technology and computer skills to access data concerning repair procedures and manufacturers' updates.**

11. **prepare logs, records, and documentation to appropriate standards.**

12. **apply business practices and communication skills to improve customer service.**

13. develop and use personal and professional strategies and plans to improve professional growth, job performance, and work relationships.

14. 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.

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 basic motive power system problems by using critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships.

Elements of the Performance

- identify the technical criteria necessary to resolve basic motive power system problems
- apply knowledge of basic engines, drive lines, fuel delivery, ignition, vehicle suspension, steering, and brake systems to analyse and resolve technical problems
- inspect, test, and make adjustments to basic motive power systems according to established procedures
- use a variety of resources (e.g., technical manuals, Internet, CD-ROM, suppliers, coworkers) to acquire relevant technical information
- apply mathematical and scientific analysis for maintaining and testing basic components, equipment, and systems
- use a systematic approach to problem solving and decision making
- recognize limitations in problem solving
- calculate and convert Imperial and SI measurement units using a variety of methods
- verify solutions by using diverse problem-solving techniques
- build a repertoire of problem-solving skills through experience and other learning opportunities
- connect and operate basic diagnostic test equipment in compliance with manufacturers' recommendations

2. *The graduate has reliably demonstrated the ability to*

identify, inspect, and test basic engine components and systems in compliance with manufacturers' recommendations.

Elements of the Performance

- inspect and measure bearings and seals
- select and apply sealants
- disassemble, measure, and assemble engines and their components
- inspect and test engine cooling systems
- inspect and test belts and pulleys
- inspect and test lubrication systems
- identify different engine types and sizes
- take into account engine removal concerns such as lifting and hoisting
- perform and follow basic maintenance procedures (e.g., lubrication, oil change, filter change)

3. *The graduate has reliably demonstrated the ability to*

identify, inspect, and test basic electrical, electronic, and emission components and systems in compliance with manufacturers' recommendations.

Elements of the Performance

- inspect and test batteries, and charging and starting systems
- use manufacturers' wiring diagrams to locate electrical components and circuits
- inspect, test, and repair circuits and circuit protection devices
- inspect intake and exhaust systems
- inspect and test fuel systems
- replace filters
- input and output test fuel injection, exhaust gas recirculation (EGR), secondary air injection (AIR) pumps, and emission components
- remove and replace fuel system components
- identify and inspect emission components

4. *The graduate has reliably demonstrated the ability to*

identify, inspect, and test basic drive train components and systems in compliance with manufacturers' recommendations.

Elements of the Performance

- apply basic diagnostic procedures to push-type clutches and flywheel assemblies
- adjust and/or replace clutch assemblies
- apply basic diagnostic procedures to manual transmissions/transaxles
- dismantle, inspect, and test driveline components of rear wheel drive vehicles and front wheel drive vehicles

5. *The graduate has reliably demonstrated the ability to*

identify, inspect, and test basic suspension, steering, and brake components and systems in compliance with manufacturers' recommendations.

Elements of the Performance

- inspect and test suspension system components and subassemblies
- apply basic diagnostic procedures to tire and rim assemblies
- identify, inspect, and replace brake lines
- replace or adjust hand and parking brake assemblies
- inspect and service disc and drum brake assemblies
- identify and inspect brake system components and subassemblies

6. *The graduate has reliably demonstrated the ability to*

disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.

Elements of the Performance

- assess the performance characteristics, limitations, potential, and safety of machinery, tools, and other equipment
- repair or correct component faults
- use appropriate tools, equipment, and processes to remove, replace, and assemble components
- install and remove fasteners
- use oxyacetylene welding and metal inert gas (MIG) welding equipment as required
- use repair techniques such as drilling, tapping, and welding
- select and use hand tools properly
- use measuring devices such as micrometers

7. *The graduate has reliably demonstrated the ability to*

use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems.

Elements of the Performance

- test basic engine, electrical, electronic, emission, drive train, suspension, steering, and brake components and systems
- use a variety of references to complete testing
- use the correct testing equipment and setup for the accurate assessment of equipment performance
- identify problems of an electrical/electronics nature and apply established practice to arrive at practical solutions
- service and maintain equipment when appropriate
- follow established service schedules
- identify whether a fault is electrical, electronic, or mechanical in nature
- recommend appropriate repair process
- apply inspection and testing procedures using basic diagnostic equipment in compliance with manufacturers' recommendation
- apply knowledge of instrumental theory to the performance of analyses
- recognize abnormal results according to guidelines and respond accordingly
- interpret and report results of analysis using required format
- use testing equipment and their associated data systems
- perform physical testing on motive power components, assemblies, and systems
- check the calibration of a variety of trade tools and equipment
- maintain precision and non-precision measuring tools such as micrometers, verniers, and calipers

8. *The graduate has reliably demonstrated the ability to*

apply basic knowledge of hydraulics and pneumatics to the testing and inspection of basic motive power systems and subsystems.

Elements of the Performance

- analyse the operation of fluid systems
- inspect vehicle suspension systems utilizing hydraulic and pneumatic principles
- maintain vehicle braking systems using knowledge of hydraulics and pneumatics
- recognize the design features and operation of fluid conditioners, pumps, valves, and actuators

9. *The graduate has reliably demonstrated the ability to*

communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.

Elements of the Performance

- interpret and prepare work-related documents
- write and prepare reports, business letters, and memos
- organize, interpret, write, and produce technical reports
- use correct automotive terminology suited to the situation and the persons involved
- communicate well with others in oral and written formats
- use electronic media appropriately
- plan, organize, and deliver oral presentations using appropriate technology
- compile, organize, and present data in accordance with established procedures and to recognized standards

10. *The graduate has reliably demonstrated the ability to*

use information technology and computer skills to access data concerning repair procedures and manufacturers' updates.

Elements of the Performance

- use computer hardware and applications to access, exchange, store, retrieve, process, organize, and present repair information and produce technical documents within a transportation environment
- research CD-ROMs for repair information from manufacturers
- access electronically manufacturers' data bases
- use a variety of search engines to find manufacturers' service bulletins and updates

11. *The graduate has reliably demonstrated the ability to*

prepare logs, records, and documentation to appropriate standards.

Elements of the Performance

- prepare technical documentation such as operator, maintenance, repair, and installation procedures
- use and maintain paper-based and electronic systems to store and retrieve information
- interpret and use information from technical manuals
- maintain current, clear, and accurate project-related documents in accordance with established organizational practices
- use records to prepare reports
- prepare installation records
- prepare maintenance and service logs
- document clearly work processes such as problem-solving methodologies and troubleshooting procedures
- document the testing of equipment and systems
- keep logs of work completed
- contribute to recording inventory

12. *The graduate has reliably demonstrated the ability to*

apply business practices and communication skills to improve customer service.

Elements of the Performance

- apply principles of customer service when dealing with customers
- participate in the development of strategies to support operations and customer service requirements
- use time, equipment, and materials in a cost-effective manner
- apply basic knowledge of sales and marketing when dealing with customers
- perform the work of customer service support positions such as parts/counter personnel and service writer
- contribute to parts, service, and equipment sales
- help find solutions to customers' problems
- recognize the importance of appropriate behaviour when dealing with customers of various cultures

13. *The graduate has reliably demonstrated the ability to*

develop and use personal and professional strategies and plans to improve professional growth, job performance, and work relationships.

Elements of the Performance

- apply a systematic approach to decision making
- keep abreast of changes in the motive power field
- use appropriate self-management techniques (e.g., time management, stress management)
- recognize the importance of ongoing professional development
- apply team work and interpersonal knowledge and skills to improve work relationships
- act reliably, flexibly, and tactfully, and use good judgement in all interpersonal situations
- listen effectively and respond appropriately to feedback
- recognize the importance of professional associations and the value of obtaining professional designations and certification

14. *The graduate has reliably demonstrated the ability to*

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.

Elements of the Performance

- comply with environmental, health, and safety legislation and their related codes and regulations such as the Workplace Hazardous Materials Information System (WHMIS), and the Occupational Health and Safety Act (OHSA)
- perform all work in accordance with the established workplace safety protocols
- consider the significance of legal and ethical issues such as human rights, health and safety, employment standards, and privacy within business operations
- apply appropriate material handling procedures to vehicle subsystems and assemblies
- support the provision of a healthy and safe workplace environment
- comply with work specifications and other technical documents
- adhere to applicable laws, regulations, codes, standards, requirements, and policies relating to transportation (e.g., vehicle safety laws, Highway Traffic Act)

III. Generic Employability Skills Standard

All graduates of Motive Power Fundamentals programs of instruction must have achieved the eleven generic employability skills learning outcomes listed on the following pages, in addition to achieving the vocational learning outcomes and meeting the general education standard. In the generic employability skills learning outcomes, an ***explanation*** *of the outcome is also provided to help ensure clarity.*

Synopsis of the Generic Employability Skills Learning Outcomes Motive Power Fundamentals Programs

The graduate has reliably demonstrated the ability to

1. **communicate clearly and coherently using written and spoken formats which fulfil the purpose and meet the needs of the audiences.**

2. **locate and select the current, relevant, and useful information required to complete tasks.**

3. **interpret information, instructions, claims, and ideas with the accuracy required to complete tasks.**

4. **execute mathematical operations with the accuracy required to solve routine problems.**

5. **use computers and other technological tools to perform routine tasks.**

6. **manage the use of time and other resources to complete tasks and attain goals.**

7. **solve problems, using a variety of strategies.**

8. **interact with others in groups or teams in ways that contribute to effective working relationships.**

9. **take responsibility for his or her own actions.**

10. **analyze and present his or her skills, knowledge, attributes, and experience for personal development and employment purposes.**

11. **adapt his or her current skills and knowledge to new situations.**

The Generic Employability Skills Learning Outcomes

1. *The graduate has reliably demonstrated the ability to*

communicate clearly and coherently using written and spoken formats which fulfil the purpose and meet the needs of audiences.

Explanation

Communicating in a clear and concise manner requires producing the spoken and written material that best suits the situation. Graduates will have developed their ability to recognize the differing needs of their audiences, to identify what is required, and to match those needs with the message that is most appropriate. They will communicate using the style and conventions required, and they will check their communication for accuracy and clarity, making adjustments where necessary.

Elements of the Performance

- Plan and organize communications according to the purpose and audiences
- Incorporate content that is meaningful and necessary
- Ensure that the message conforms to the conventions of a format (e.g., memo, e-mail, weekly report, care plan, daily log, formal presentation)
- Use language and style suitable to the audiences and purposes
- Revise the message, adjusting for errors in content and mechanics (e.g., spelling, punctuation, usage, sentence structure)
- Use tone, volume, and pace suitable to the audiences and purposes
- Employ effective listening and reading skills to gather feedback to communication
- Respond to verbal and nonverbal feedback

2. *The graduate has reliably demonstrated the ability to*

locate and select the current, relevant, and useful information required to complete tasks.

Explanation

Completing tasks often requires information that can be used as support. Graduates, therefore, must be able to access current, relevant, and useful information and to make effective use of that information. Graduates will have developed and used strategies to locate an appropriate range of information. They will have learned how to select pertinent information and to sort it. This information can then be used to support decisions and to assist in the completion of tasks.

Elements of the Performance

- Determine the nature of the information required
- Consult a variety of information sources (e.g., people, text, databases, electronic and non-electronic libraries and networks)
- Gather information from appropriate sources
- Examine the information and select what is relevant, important, and useful
- Use typical formats to record information
- Use information ethically
- Acknowledge and credit the source of material in both written and oral reports

3. *The graduate has reliably demonstrated the ability to*

interpret information, instructions, claims, and ideas with the accuracy required to complete tasks.

Explanation

Responding to messages from many sources requires the ability to receive messages and to comprehend what has been received. Graduates will have developed the skills to receive messages through listening, reading, and observation. The important role of information in personal and workplace situations requires graduates to be able to understand material produced by others. Graduates will have demonstrated their understanding of the messages they receive through accurate reports (in a variety of formats) or through completing tasks related to the messages.

Elements of the Performance

- Use strategies to read, listen, and observe effectively (e.g., note-taking techniques, skimming, concept maps, concentration tools, asking for clarification)
- Clarify what has been read, heard, and observed
- Present an accurate spoken or written report of what has been read, heard, and observed
- Outline the arguments used to support claims
- Examine the material used to support claims distinguishing between fact and opinion
- Acknowledge and credit the source of information, ideas, and concepts
- Follow instructions
- Complete tasks making use of the messages received

4. *The graduate has reliably demonstrated the ability to*

execute mathematical operations with the accuracy required to solve routine problems.

Explanation

Completing regular personal and workplace tasks requires the ability to use mathematical techniques to arrive at accurate solutions. Graduates will have developed their ability to identify tasks and problems which require mathematics, to apply mathematical techniques (concepts, conventions, strategies, and operations), and to check the results of their applications.

Elements of the Performance

- Recognize situations that require mathematics
- Estimate probable answers
- Apply mathematical principles
- Execute routine mathematical operations
- Check for errors in numerical answers and the appropriate fit between problems and answers

5. *The graduate has reliably demonstrated the ability to*

use computers and other technological tools to perform routine tasks.

Explanation

Using computers and other technologies to increase productivity and to expedite everyday tasks requires graduates to have the confidence and ability to recognize when computers and other technologies contribute to completing routine tasks and solving problems. They will have demonstrated the ability to make use of the technological tools appropriate to typical daily tasks in personal and in working life.

Elements of the Performance

- Use basic operating system functions (e.g., load, save, retrieve)
- Choose the most appropriate available technology to complete the task
- Use the software, equipment, and tools correctly and ethically to complete routine tasks
- Deal with equipment and software problems and errors in a logical and systematic manner
- Use common technological tools effectively (e.g., calculators, fax machines, voice mail systems, VCR's)

6. *The graduate has reliably demonstrated the ability to*

manage the use of time and other resources to complete tasks and attain goals.

Explanation

Achieving task-related goals in their personal and professional lives requires graduates to use time, money, space, and other – often limited – resources as efficiently as possible. Graduates will have developed their ability to plan and predict efficient ways of achieving goals. They will use tools designed to assist in the process.

Elements of the Performance

- Set reasonable and realistic goals
- Prioritize tasks
- Use appropriate planning tools (e.g., budgets, schedules) to achieve goals
- Use resources (e.g., time, equipment, materials, money, information, support systems) efficiently to accomplish tasks
- Monitor the process and expectations, and make necessary adjustments

7. *The graduate has reliably demonstrated the ability to*

solve problems, using a variety of strategies.

Explanation

Solving a range of problems and dealing with a variety of tasks require the thinking skills and strategies that will allow graduates to identify what has to be done and to select and implement a suitable approach. Graduates will also be able to develop their creative thinking skills as they find alternative ways to address a situation.

Elements of the Performance

- Recognize when there is a problem to be solved
- Analyze the problem
- Select the thinking skills and strategies (e.g., inductive and deductive thinking, brainstorming, clustering) which could be used to solve the problem
- Develop solutions using selected skills and strategies
- Implement the preferred solution
- Evaluate the effectiveness of the strategies and the solution

8. *The graduate has reliably demonstrated the ability to*

interact with others in groups or teams in ways that contribute to effective working relationships.

Explanation

Working in teams or groups in either a work or a social context requires interacting effectively with the members of the group. Graduates will have demonstrated their ability to identify and complete the various tasks required of them as individuals and as group members. They will also have demonstrated their ability to consider and respond to others.

Elements of the Performance

- Work with the group or team to clarify tasks, roles, and responsibilities
- Clarify one's own roles and fulfill them in a timely fashion
- Contribute one's own ideas, opinions, and information while demonstrating respect for those of others
- Treat other members of the group or team equitably and fairly
- Contribute to a group's evaluation of its progress and interactions

9. *The graduate has reliably demonstrated the ability to*

take responsibility for his or her own actions.

Explanation

Taking positions and completing tasks require graduates to be accountable for actions taken. Graduates will have demonstrated their ability to explain what they do and why they do it. They will acknowledge the consequences of their actions and examine feedback on their actions.

Elements of the Performance

- Acknowledge one's actions
- Acknowledge one's role in group activities
- Review the results of one's actions
- Identify the successes resulting from one's actions
- Identify any problems resulting from one's actions and make adaptations
- Evaluate and act upon feedback

10. *The graduate has reliably demonstrated the ability to*

analyze and present his or her skills, knowledge, attributes, and experience for personal development and employment purposes.

Explanation

Preparing for changes in their personal and professional lives requires graduates to assess and present their accomplishments and abilities. Graduates will have developed their ability to identify and reflect on what they have done and learned. They will have summarized their abilities in ways that are attractive and useful to potential recipients and to themselves.

Elements of the Performance

- Summarize one's own skills, knowledge, attributes and experience fully and realistically
- Present oneself using a format which best identifies skills, knowledge, attributes, and experience (e.g., resume, portfolio, interview, web page)
- Analyze feedback to presentations of oneself

11. *The graduate has reliably demonstrated the ability to*

adapt his or her current skills and knowledge to new situations.

Explanation

Graduates will have developed the confidence to know that their current skills are applicable to a range of changing, novel, and unexpected situations. They will have demonstrated their ability to reflect on what they can do, match those skills to the new demands, and identify additional skills which will make them effective in new situations. They will be able to plan for further learning opportunities to help them develop the new skills and knowledge.

Elements of the Performance

- Assess current skills and knowledge
- Recognize situations which require adaptation of skills and knowledge
- Identify skills and knowledge required for new personal and workplace situations and make plans to acquire them
- Set goals for continued broadening of skills, knowledge, attitudes, and experience to respond to changes in personal and working life

IV. General Education Standard

All graduates of Motive Power Fundamentals programs of instruction must have met a locally determined general education requirement, in addition to achieving the vocational and generic employability skills learning outcomes.

The General Education Requirement for Ontario College Certificate Programs

Colleges may determine locally the appropriate inclusion of general education learning outcomes in Ontario College Certificate programs. However, it is desirable that graduates at this level will have been engaged in learning that incorporates some breadth beyond the vocational field of study.

The general education requirement is an integral component of the Motive Power Technician Program Standard, along with the vocational and generic employability skills learning outcomes.