



Carpentry and Renovation Techniques Program Standard

**The approved program standard for
Carpentry and Renovation Techniques
program of instruction leading to an
Ontario College Certificate delivered by
Ontario Colleges of Applied Arts and
Technology (MTCU funding code 47600)**

Ministry of Advanced Education and Skills Development
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I. Introduction

This document is the Program Standard for the Carpentry and Renovation Techniques program of instruction leading to an Ontario College Certificate delivered by Ontario colleges of applied arts and technology (MTCU funding code 47600).

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 and Evaluation Unit of the Ministry of Advanced Education and Skills Development have 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),
- **Essential employability skills** (the essential employability skills learning outcomes which apply to all programs of instruction); and
- **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 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 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 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 Advanced Education and Skills Development will undertake regular reviews of the vocational learning outcomes for this program to ensure that the Carpentry and Renovation Techniques 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 Advanced Education and Skills Development at the address or email address noted on the inside cover page.

II. Vocational Standard

All graduates of Carpentry and Renovation Techniques programs have achieved the vocational learning outcomes (VLOs) listed in the following pages, in addition to achieving the ten essential employability outcomes and meeting the general education (GE) requirement.

Preamble

Graduates of the Carpentry and Renovation Techniques program carry out trades-related functions and general building tasks in a range of *building construction and renovation projects** within the residential and light commercial sectors of the construction industry.

Graduates work collaboratively with a range of tradespersons and *project stakeholders** and perform all tasks in accordance with project plans, workplace health and safety practices, *sustainability practices** and all applicable laws, building codes, industry standards and ethical practices.

As members of the building team, graduates work with diverse clients, supervisors and co-workers to support *building construction and renovation projects**.

Graduates solve on-site trade-related building and renovation problems by applying principles of green building, *basic technical mathematics** and *building science**.

Graduates assist with maintaining accurate project documents and use technologies to support *building construction and renovation projects**.

Graduates of the Carpentry and Renovation Techniques program select, maintain and safely operate hand and power tools and use “hands-on” skills to assist with framing, layout, stair construction and the application of exterior and interior finishes in the completion of building and renovation projects.

Graduates are typically employed in entry-level positions in the building and renovation field assisting with residential and light commercial building, carpentry, renovation and restoration and maintenance tasks. Employment opportunities may also be available to graduates in lumberyards and building supply stores.

Graduates of the Carpentry and Renovation Techniques program identify and use strategies to enhance professional growth and ongoing learning in the building and renovation field.

Graduates have achieved foundational knowledge and skills in the building and renovation field and may pursue further educational opportunities in postsecondary diploma and apprenticeship programs. Graduates should contact individual colleges for further information.

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

Synopsis of the Vocational Learning Outcomes

Carpentry and Renovation Techniques (Ontario College Certificate)

The graduate has reliably demonstrated the ability to

1. identify and use strategies to enhance work performance and continued learning to keep pace with industry changes.
2. identify and adhere to established health and safety practices that apply to specific job sites, in accordance with current legislation and regulations.
3. perform building construction and renovation tasks in compliance with contracts, the Ontario and/or National Building Codes, applicable laws and industry's ethical practices.
4. work in accordance with established *sustainability practices**.
5. communicate and collaborate with diverse clients, supervisors and tradespersons to complete projects on time and to maintain effective working relationships.
6. assist with maintaining accurate project documents and use computer technologies to support building construction and renovation projects*.
7. solve on-site trade-related building and renovation problems by applying principles of *basic technical mathematics** and *building science**.
8. select, maintain and safely operate hand tools, and portable and stationary power tools, to efficiently complete building construction and renovation tasks.
9. assist with the completion of building and renovation stages, from site layout and footings to the application of interior and exterior finishes, according to specifications.
10. assist in the preparation of material estimations according to building construction and renovation project* documents.

*See Glossary

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 and use strategies to enhance work performance and continued learning to keep pace with industry changes.

Elements of the Performance

- identify opportunities in the building construction and renovation field spanning apprenticeships, academic, work and entrepreneurship options
- use appropriate self-management techniques (e.g., time management, stress management)
- identify the need for self-evaluation and explain the importance of lifelong learning
- seek assistance to resolve problems beyond own knowledge and skills
- seek out and act upon constructive feedback to enhance work performance
- identify training courses, workshops and mentoring opportunities to enhance employment in the building construction and renovation field

2. The graduate has reliably demonstrated the ability to identify and adhere to established health and safety practices that apply to specific job sites, in accordance with current legislation and regulations.

Elements of the Performance

- identify employee rights and responsibilities associated with health and safety practices
- conduct self in safe manner and in accordance with the requirements of work situation
- maintain a safe, clean and organized worksite
- identify potential risks/hazards in the workplace setting and initiate action to mitigate unsafe or hazardous situations or materials
- participate in daily safety talks on job site
- comply with all requirements of the current Ontario Health and Safety Act, 1990
- maintain all required health and safety training and certification e.g., Workplace Hazardous Materials Information System (WHMIS), Working at Heights and Confined Space Safety training where appropriate
- select and use Personal Protective Equipment (PPE) and safety equipment
- perform safety Lockout/Tagout (LOTO) procedures for machinery and power sources
- inspect tools and equipment for damage and remove from service when appropriate

3. The graduate has reliably demonstrated the ability to perform building construction and renovation tasks in compliance with contracts, the Ontario and/or National Building Codes, applicable laws, regulations and industry's ethical practices.

Elements of the Performance

- read and interpret building plans and specifications
- identify how current legislation, codes and standards including the Ontario and National Building Codes and regulations govern *building construction and renovation projects**
- maintain current knowledge of changing codes, regulations and standards
- adhere to current laws, standards, codes and bylaws that regulate the equipment and materials used in *building construction and renovation projects**
- use under direction, equipment and materials in compliance with relevant law, legislation, standards, codes and bylaws
- perform ethical work practices within the construction industry

*See Glossary

4. The graduate has reliably demonstrated the ability to work in accordance with established *sustainability practices**

Elements of the Performance

- identify legislative requirements for environmental protection that apply to *building construction and renovation projects**
- identify the principles of sustainable development, including environmental stewardship and economic performance in project work
- identify current and/or applicable sustainability practices e.g., LEED, Net Zero Energy, Green Globes etc.
- use recycled materials when appropriate and alternative resources to reduce impact on environment
- minimize waste and use waste diversion strategies as directed
- follow identified *sustainability practices** on the worksite
- identify sustainability practices, related to materials and techniques, used to extend the building lifecycle

*See Glossary

5. The graduate has reliably demonstrated the ability to communicate and collaborate with diverse clients, supervisors and tradespersons to complete projects on time and to maintain effective working relationships.

Elements of the Performance

- identify the relationships involved in the planning, designing and implementation of *building construction and renovation projects**, i.e., owners, architects, builders, renovators and tradespersons
- identify the roles performed by the sub-trades involved in *building construction and renovation projects**, including electrical, plumbing, mechanical and masonry trades
- work collaboratively with a range of tradespersons
- describe one's own role as a member of a building team working on building construction and renovation projects*
- establish and maintain good client relationships
- take initiative and work independently with minimal supervision
- work as an effective team player to complete tasks while promoting a positive work environment
- apply effective organizational and time-management strategies in own work
- take responsibility for one's job related performance, as an individual and as a member of a multidisciplinary team
- obtain assistance from the appropriate tradesperson or supervisor to seek clarification and/or resolve problems where indicated
- use effective communication skills including the use of industry-specific terminology suited to the situation and *project stakeholders**
- participate as a team member during on-site project-related meetings

*See Glossary

6. The graduate has reliably demonstrated the ability to assist with maintaining accurate project documents and use technologies to support *building construction and renovation projects**.

Elements of the Performance

- use industry specific terminology as it relates to building materials, projects and trades
- read and interpret building documents including drawings, specifications and schedules
- assist with project records, logs and schedules
- use basic sketching skills to prepare preliminary sketches for relay of information and review by other building and design professionals
- identify how technology and technological change affect the construction industry
- access and share information using communication technologies
- use appropriate software to contribute to the organization of project related data

*See Glossary

7. The graduate has reliably demonstrated the ability to solve on-site trade-related building and renovation problems by applying principles of *basic technical mathematics** and *building science**.

Elements of the Performance

- perform standard conversions between metric and imperial units of measurement
- calculate building elevations
- calculate angles and slopes in framing and roofing layout
- carry out calculations for floor layouts and spacing for fixtures and appliances
- complete linear counts, area, perimeter and volumetric calculations as required for material take-off
- use *building science** and construction terminology correctly
- apply basic knowledge of building materials, methods, building envelope and environmental controls to assist in solving building construction and renovation problems

*See Glossary

8. The graduate has reliably demonstrated the ability to select, maintain and safely operate hand tools, and portable and stationary power tools, to efficiently complete building construction tasks.

Elements of the Performance

- select, use and maintain hand tools for boring, cutting, abrading, assembly, dismantling, measuring, squaring, marking and clamping of building materials
- select, use and maintain portable power tools such as electric, pneumatic, battery-powered and gas-powered to complete cutting and assembly operations
- select, use and maintain stationary tools, such as table saws, planers and joiners to prepare building materials
- establish safe and proper use of tools according to manufacturer's recommendations
- select and use materials, fasteners and connectors commonly used in the building construction industry
- identify and articulate limitations to certain building materials
- use manual and electronic layout and survey instruments to assist in site layout

9. The graduate has reliably demonstrated the ability to

assist with the completion of building and renovation stages, from site layout and footings to the application of interior and exterior finishes, according to specifications.

Elements of the Performance

- assist in the layout of a foundation and building lines
- assist with the building and dismantling of access structures such as scaffolds, ladders, temporary stairs and ramps
- assist in formwork for footings and foundations
- assist in the layout and construction of floor, wall, ceiling and roof systems and insulation
- assist in the installation of exterior doors and windows
- assist in the installation of interior stairs, doors, finishes and trim
- assist in the building decks, stairs, porches and platforms
- maintain a clean and organized work site
- assist with deconstruction procedures and follow requirements for the safe handling of waste materials
- identify opportunities to recycle and repurpose building materials
- identify when certain materials and/or equipment are to be used based on climate and weather conditions

10. The graduate has reliably demonstrated the ability to assist in the preparation of material estimations according to *building construction and renovation projects** documents.

Elements of the Performance

- apply basic quantity surveying principles to assist in construction takeoff and ordering
- assist in the calculation of quantities for excavation, concrete, formwork, masonry and framing
- use industry standards relating to allowance for material and time allotments for labour calculations
- assist in the preparation of purchase orders for required materials

*See Glossary

Glossary

basic technical mathematics – The application of foundational mathematical concepts to technical problems. Basic technical math for the trades includes fractions, ratios and proportions, measurement conversions, geometric representations or formulas.

building science – Systematic theory and research related to construction work, building materials, methods, building envelope.

building construction and renovation project(s) – A field within the building and construction industry with an emphasis on the residential and small commercial sectors. Projects vary in scope and may include the building, renovation or rehabilitation of small commercial, single family, townhouse, multi-residential and custom home buildings.

project stakeholders – Any group or individual who has a vested interest in the project including the clients, designers, tradespersons, suppliers, management team and municipal authorities.

sustainability practices – Includes the decisions and activities that apply the concepts of environmental, economic and social sustainability and lifecycle assessment into the planning, design, implementation and evaluation of building construction and renovation projects. Sustainability practices also consider the concept of grey energy i.e., the energy consumed in the lifecycle of building materials from production to disposal (adapted from The Canadian Society of Civil Engineering, *“Entrusted to Our Care” Guidelines for Sustainable Development*, 2007).

III. Essential Employability Skills

All graduates of the Carpentry and Renovation Techniques program of instruction must have reliably demonstrated the essential employability skills learning outcomes listed on the following pages, 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 & 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	Defining Skills: Skill areas to be demonstrated by graduates:	Learning Outcomes: The levels of achievement required by graduates. The graduate has reliably demonstrated the ability to:
Communication	<ul style="list-style-type: none"> • Reading • Writing • Speaking • Listening • Presenting • Visual literacy 	<ol style="list-style-type: none"> 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.
Numeracy	<ul style="list-style-type: none"> • Understanding and applying mathematical concepts and reasoning • Analyzing and using numerical data • Conceptualizing 	<ol style="list-style-type: none"> 1. execute mathematical operations accurately.
Critical Thinking & Problem Solving	<ul style="list-style-type: none"> • Analyzing • Synthesizing • Evaluating • Decision making • Creative and innovative thinking 	<ol style="list-style-type: none"> 1. apply a systematic approach to solve problems. 2. use a variety of thinking skills to anticipate and solve problems.

Skill Category	Defining Skills: Skill areas to be demonstrated by graduates:	Learning Outcomes: The levels of achievement required by graduates. The graduate has reliably demonstrated the ability to:
Information Management	<ul style="list-style-type: none"> • Gathering and managing information • Selecting and using appropriate tools and technology for a task or a project • Computer literacy • Internet skills 	<ol style="list-style-type: none"> 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.
Interpersonal	<ul style="list-style-type: none"> • Teamwork • Relationship management • Conflict resolution • Leadership • Networking 	<ol style="list-style-type: none"> 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.
Personal	<ul style="list-style-type: none"> • Managing self • Managing change and being flexible and adaptable • Engaging in reflective practices • Demonstrating personal responsibility 	<ol style="list-style-type: none"> 1. manage the use of time and other resources to complete projects. 2. take responsibility for one's own actions, decisions and their consequences.

IV. General Education Requirement

All graduates of the Carpentry and Renovation Techniques program must have met the general education requirement described on the following pages, 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 (Appendix A in the Minister's Binding Policy Directive Framework for Programs of Instruction).

In programs of instruction leading to either an Ontario College Diploma or an Ontario College Advanced Diploma, 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 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.

1. **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.

2. **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.

3. 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.

4. 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.

5. 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.