



Glazier

Guide to Course Content

2024



Online: www.saskapprenticeship.ca

Recognition:

To promote transparency and consistency, this document has been adapted from the 2020 Glazier Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

STRUCTURE OF THE GUIDE TO COURSE CONTENT

To facilitate understanding of the occupation, this guide to course content contains the following sections:

Description of the Glazier trade: an overview of the trade's duties and training requirements.

Essential Skills Summary: an overview of how each of the nine essential skills is applied in this trade.

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard detailing the essential skills and the level of training where the content is covered.

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities.

Task: distinct actions that describe the activities within a major work activity.

Sub-task: distinct actions that describe the activities within a task.

Training Profile Chart: a chart which outlines the model for Alberta Apprenticeship technical training.

DESCRIPTION OF THE GLAZIER TRADE

Glaziers cut, prepare, fabricate and install glass in residential, commercial and industrial structures, and in furniture and motor vehicles.

Glazier's measure, handle, cut, prepare, fit, install, replace and repair all types of glass and glass substitutes, typically in industrial, commercial, institutional and residential applications. In these applications, they fabricate, lay out and install curtain wall framing, windows, doors, structural silicone glazing (SSG), skylights, sloped glazing and storefront frames. In residential applications, they install doors, windows, skylights, mirrors, shower doors, specialty glass and backsplash.

Glaziers also install specialty glass products such as glass railings/guardrails, smoke baffles, shower enclosures, and glass and mirror walls. Other duties include layout, preparation, fabrication and replacement of architectural metal systems and components in applications such as partition glass, entranceways, windows, sunshades, insulated glass, points-supported glazing and fittings, panels and pre-glazed curtain walls, including the respective seals, sealants, anchors and fasteners.

Most glaziers work on construction, service or renovation (retrofitting) projects. Specialty areas of this trade include installing skylights and other special glassworks like electrochromic glass, photovoltaic panels, fire-rated glass and compatible systems, obscured glass, patterned glass, ballistic/bomb-resistant glass in security areas, leaded x-ray glass in hospitals, low-iron glass for showcases in museums and acid-etched glass for bird-friendly glazing applications. Glaziers are employed by construction glass installation contractors, fabrication shops, retail service and repair shops. They may also be self-employed.

Besides working with glass, glaziers also work with plastics, granite, and other similar materials used as glass substitutes, as well as films or laminates that improve the durability or safety of the glass. Glaziers are also involved in manufacturing display cabinets and decorative windows. They may also be requested to create custom-designed glass installations for residential and commercial use.

Glaziers require good reading, writing and communication skills, as well as mathematical ability to accomplish tasks within their trade. Physical strength and stamina are necessary to work with heavy glass materials, and good eyesight is needed to measure, cut and detect flaws in glass and other materials. Manual dexterity and the ability to work alone and in teams are important qualities for those working in this trade. As well, analytical ability and troubleshooting skills are important assets in this trade, especially in the context of renovation and repair projects involving older structures and products.

Glaziers work in a variety of environments; some work outdoors on construction sites while others work indoors, in shops. When working on commercial applications, glaziers are expected to work from power-elevated work platforms, scaffolds and suspended work platform systems, sometimes at great heights, to manoeuvre glass panels that are lifted by cranes and other lifting equipment. Glaziers do a considerable amount of bending, kneeling, lifting, and standing during the installation process. There are some risks of injuries from falls from heights, lifting heavy materials, repetitive actions, sharp edges and broken glass. This standard recognizes similarities or overlaps with the work of carpenters, sheet metal workers, concrete finishers, operating engineers, electricians, roofers, bricklayers, tilers and ironworkers.

With experience, glaziers may act as mentors and trainers to apprentices in the trade. Glaziers may advance to supervisory positions such as foreperson, contract managers, project managers, consultants, inspectors, instructors, or set up their own shops.

Training Requirements: To graduate from each level of the apprenticeship program, an apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year. Total trade time required is 7200 hours and at least 4 years in the trade.

There are four levels of technical training which are delivered outside of the province of Saskatchewan:

- Level One: 6 weeks
- Level Two: 6 weeks
- Level Three: 6 weeks
- Level Four: 6 weeks

The information contained in this guide to course content details the technical training delivered for each level of apprenticeship. An apprentice spends approximately 15% of their apprenticeship term in a technical training institute learning the technical and theoretical aspects of the trade. The hours and percentages of technical and practical training may vary according to class needs and progress.

The content of the technical training components is subject to change without notice.

Entrance Requirements for Apprenticeship Training

Your grade twelve transcripts (with no modified classes) or GED 12 is your guarantee that you meet the educational entrance requirements for apprenticeship in Saskatchewan. In fact, employers prefer and recommend apprentices who have completed high school. This ensures the individual has all of the necessary skills required to successfully complete the apprenticeship program and receive journey person certification.

Individuals with “modified” or “general” classes in math or science do not meet our entry requirements. These individuals are required to take an entrance assessment prescribed by the SATCC.

English is the language of instruction in all apprenticeship programs and is the common language for business in Saskatchewan. Before admission, all apprentices and/or “upgraders” must be able to understand and communicate in the English language. Applicants whose first language is not English must have a minimum Canadian Language Benchmark Assessment of six (CLB6).

Note: A CLB assessment is valid for a one-year period from date of issue.

| Designated Trade Name | Math Credit at the Indicated Grade Level ^❶ | Science Credit at Grade Level |
|---|---|-------------------------------|
| Glazier | WA 10 or F 10 or P 10 or Math 10 | Grade 10 |
| <p>❶ - (One of the following) WA – Workplace and Apprenticeship; or F – Foundations; or P – Pre-calculus, or a Math at the indicated grade level (Modified and General Math credits are not acceptable.).</p> <p>*Applicants are recommended to take Chemistry 20 or Physics 30 or English and Math at Level 30 prior to course.</p> <p>*Applicants who have graduated in advance of 2015-2016, or who do not have access to the revised Science curricula will require a Science at the minimum grade level indicated by trade.</p> <p>For information about high school curriculum, including Math and Science course names, please see: http://www.curriculum.gov.sk.ca/#</p> | | |

**Individuals not meeting the entrance requirements will be subject to an assessment
and any required training**

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

READING

Glaziers require reading skills to gather information from forms and labels. They also need to read to understand more complex texts such as equipment and policy and procedure manuals, specifications, codes, standards, and safety regulations. They read bulletins and brochures from suppliers describing new products, parts and prices. They also refer to project specifications and work orders when planning a job.

DOCUMENT USE

Glaziers need to be able to locate and interpret information in several types of documents such as labels/stickers, posted signs, forms, lists, tables, and installation and delivery schedules. They also refer to a wide array of complex assembly drawings integrating text, drawings and actual components. This also includes creating sketches and drawings.

WRITING

Writing skills are used by glaziers to write notes to themselves regarding work orders and customer requests. They may also write notes to request supplies and materials or write memos and letters to suppliers and manufacturers to request information on prices, equipment, parts or procedures. They may also write a quote or estimate that includes costs of labour to remove existing materials and install the new product, as well as costs of all materials. They also need to complete documents such as time sheets, shipping documents, purchase orders, invoices, job sheets and city permits.

ORAL COMMUNICATION

Some tasks performed by glaziers require oral communication skills, including discussing safety issues, work schedules, materials and equipment with supervisors, contractors, building managers, customers, suppliers and other tradespeople. Glaziers may explain the fabrication, construction, installation and repair procedures to customers as well. They may also instruct others, such as an apprentice or a work crew, explaining and demonstrating procedures.

NUMERACY

Numeracy skills are extremely important in the everyday work of glaziers. Substantial mathematical skills are used in taking measurements, doing material layout, using formulas and performing trade calculations such as geometry and trigonometry to calculate distances and angles. Glaziers may create project timelines, calculating time requirements for tasks in the project. They may also calculate amounts for supplies, estimates and overall costs.

THINKING

Glaziers solve problems in situations where work may be delayed due to equipment breakdowns, shortages of materials and work of other trades. They may perform modifications to project designs to correct flaws. They need the ability to think spatially and visualize in three dimensions. Problem solving and thinking sequentially are important skills in service, fabrication and installation activities. Glaziers need to be able to plan their work and organize tasks and materials.

WORKING WITH OTHERS

Glaziers may work independently or with partners or apprentices depending on the type of work they are performing. For example, frame fabricators often work alone while constructing frames, while installers will usually work with a partner or apprentice while installing windows. Glaziers must coordinate their work with many other co-workers, trades and suppliers. They see themselves as members of a team who work together to provide a quality service and product. Some glaziers supervise the work of apprentices and other journeypersons on larger jobs.

DIGITAL TECHNOLOGY

Glaziers use digital devices such as laptops, tablets, smartphones and two-way radios to communicate with others, record job changes and daily activities, track job progress, order materials, perform Internet research and perform word processing. They also use design software in their work. Highly technical layout devices such as laser 3D scanners and total stations require advanced digital skills.

CONTINUOUS LEARNING

Glaziers are required to stay current with new products and materials. They refer to brochures or manuals from suppliers and apply the information on the job. They attend training by the manufacturer on how to use or install a new product. Glaziers also attend courses and orientations on safety procedures and the operation of equipment such as aerial work platforms and swing stages. They must also attend upgrading on topics such as layout, safety and rigging. On-the-job learning takes place continuously using methods such as safety meetings, toolbox talks and mentoring.

GLAZIER TASK MATRIX

This chart outlines the major work activities, tasks and sub-tasks from the 2020 Glazier Red Seal Occupational Standard. Each sub-task details the corresponding essential skill.

A - Performs common occupational skills

17%

| | | | | | |
|--|---|---|---|--|---|
| Task A-1 Performs safety-related functions | 1.01 Maintains safe work environment | 1.02 Uses personal protective equipment (PPE) and safety equipment | | | |
| Task A-2 Uses tools and equipment | 2.01 Uses hand tools | 2.02 Uses portable and stationary power tools | 2.03 Uses layout and measuring equipment | 2.04 Uses access equipment | |
| Task A-3 Uses rigging, hoisting and lifting equipment | 3.01 Uses rigging equipment | 3.02 Uses hoisting and lifting equipment | | | |
| Task A-4 Organizes work | 4.01 Uses documentation and reference material | 4.02 Interprets plans, drawings and specifications | 4.03 Prepares list of materials and supplies | 4.04 Plans project tasks | |
| Task A-5 Performs routine trade activities | 5.01 Prepares worksite | 5.02 Handles glass and other materials | 5.03 Prepares materials for installation | 5.04 Stores glass and other materials | 5.05 Performs glass cutting and edge treatment |

| | | |
|--|-----------------------|-----------------------|
| 5.06 Installs building envelope membrane | 5.07 Install flashing | 5.08 Applies sealants |
|--|-----------------------|-----------------------|

B – Fabricates and installs commercial window and door systems

34%

| | | | | | |
|--|--|------------------------------------|----------------------------------|--|--|
| Task B-7 Fabricates commercial window and door systems | 7.01 Fabricates curtain walls | 7.02 Fabricates storefronts | 7.03 Fabricates window systems | 7.04 Fabricates skylights and sloped glazing systems | 7.05 Fabricates entrance systems |
| Task B-8 Installs commercial window and door systems | 8.01 Lays out commercial window and door systems | 8.02 Installs curtain wall systems | 8.03 Installs storefront systems | 8.04 Installs window systems | 8.05 Installs skylights and sloped glazing systems |
| | 8.06 Installs entrance systems | | | | |

C – Installs residential window and door systems

14%

| | | | | | |
|--|--|---|---|--|--------------------------------|
| Task C-9 Installs residential window systems | 9.01 Lays out residential window systems | 9.02 Sets windows in openings | 9.03 Glazes windows | | |
| Task C-10 Installs residential door systems | 10.01 Lays out residential door systems | 10.02 Assembles residential door frames | 10.03 Sets residential doors and frames | 10.04 Installs residential door hardware | 10.05 Glazes residential doors |

D – Fabricates and installs specialty glass, products and glass systems

16%

| | | | |
|--|---|--|---|
| Task D-11 Fabricates and installs commercial specialty glass and products | 11.01 Lays out commercial specialty glass and products | 11.02 Assembles commercial specialty glass, products and hardware | 11.03 Installs commercial specialty glass, products and hardware |
| Task D-12 Fabricates and installs residential specialty glass and products | 12.01 Lays out residential specialty glass and products | 12.02 Assembles residential specialty glass, products and hardware | 12.03 Installs residential specialty glass, products and hardware |

E – Performs servicing

19%

| | | |
|---|--|--|
| Task E-13 Services commercial window and door systems | 13.01 Assesses service requirements for commercial window and door systems | 13.02 Repairs commercial window and door systems |
| Task E-14 Services residential window and door systems | 14.01 Assesses service requirements for residential window and door systems | 14.02 Repairs residential window and door systems |
| Task E-15 Services specialty glass and products | 15.01 Assesses services requirements for specialty glass and products | 15.02 Repairs specialty glass and products |

TRAINING PROFILE CHART

This Training Profile Chart represents Alberta's NAIT/SAIT technical training at the topic level.

| Level One |
|-----------------------------------|
| Standard Workplace Safety |
| Tools and Construction Products |
| Glass and Glass Fabrication 1 |
| Glazing and Service 1 |
| Window Systems |
| Math and Drawing Interpretation 1 |

| Level Two |
|-----------------------------------|
| Glass and Glass Fabrication 2 |
| Glazing and Service 2 |
| Construction Product Application |
| Frames and Door Systems |
| Math and Drawing Interpretation 2 |

| Level Three |
|-----------------------------------|
| Frame Systems 1 |
| Door Systems 1 |
| Glazing and Service 3 |
| Sloped Glazing Systems |
| Math and Drawing Interpretation 3 |

| Level Four |
|--|
| Red Seal Programs and Specialty Products |
| Frame Systems 2 |
| Door Systems 2 |
| Glazing and Service 4 |
| Math and Drawing Interpretation 4 |

TECHNICAL TRAINING COURSE CONTENT

This chart outlines the model for Alberta's NAIT/SAIT technical training.

| Level One | 6 weeks | 180 hours |
|--|---------|-----------|
| Standard Workplace Safety <ul style="list-style-type: none">• apply legislation, regulations and practices• use industry standard practices for climbing, lifting, rigging and hoisting• apply industry standard practices for hazardous materials and fire protection• describe the safety procedures of scaffolding and access equipment• operate swing stage scaffold system | | |
| Tools and Construction Products <ul style="list-style-type: none">• use and maintain hand tools• operate and maintain portable saws and their applications• operate and maintain stationary power tools• use fasteners, adhesives and sealants | | |
| Glass and Glass Fabrication 1 <ul style="list-style-type: none">• recognize common types of glass• perform methods of glass storage and handling• describe the glass manufacturing process• perform cutting and edging of glass | | |
| Glazing and Service 1 <ul style="list-style-type: none">• operate and maintain glazing tools used in the trade• fabricate window screening products• use codes and standards pertaining to the glazing industry• describe automotive glass removal and installation procedures• service flat glass products | | |
| Window Systems <ul style="list-style-type: none">• install residential window systems• fabricate and install a light commercial ribbon window system | | |
| Math and Drawing Interpretation 1 <ul style="list-style-type: none">• solve basic math problems• solve ratio, proportion and percentage problems• calculate quantities of glazing materials• interpret residential and light commercial drawings• produce orthographic and isometric drawings | | |

Level Two

6 weeks

180 hours

Glass and Glass Fabrication 2

- perform the layout, fabrication and installation of mirrors
 - recognize types of specialty glass and their applications
 - cut glass to various shapes
 - apply techniques for glass fabrication
 - recognize the procedures for sandblasting, etching and film application on glass
-

Glazing and Service 2

- install and service residential glazing products
 - describe service fundamentals for commercial glazing products
 - troubleshoot and repair store front entrance systems
 - remove and install auxiliary auto glass
-

Construction Product Application

- install glazing compounds and sealants
 - describe the concept of building envelope science
-

Frames and Door Systems

- fabricate and install a commercial frame and door system
 - identify flashing and panels
-

Math and Drawing Interpretation 2

- perform perimeter and area calculations related to trade based problems
 - produce basic shop drawings
 - perform drawing interpretation tasks relating to basic architectural drawings and specifications
 - determine basic material requirements to complete a job
-

Level Three

6 weeks

180 hours

Frame Systems 1

- identify aluminum framing components including finishes, properties and extrusions
 - fabricate and install a single level curtain wall
 - fabricate and install a basic frame system
 - design and install flashings and panels
-

Door Systems 1

- describe commercial door systems
 - describe associated door hardware
 - install an aluminum swing door
 - install an all glass entrance system
-

Glazing and Service 3

- assess and repair a structural glazing system
 - install a structural glazing system
 - install common types of building envelope components
-

Sloped Glazing Systems

- install and repair sloped glazing systems
 - describe the installation and repair of skylights
 - install skylight system
-

Math and Drawing Interpretation 3

- use design factors when designing glazing systems
- interpret architectural and structural drawings
- interpret project specifications
- produce a shop drawing
- generate material takeoffs

Level Four

6 weeks

180 hours

Red Seal Programs and Specialty Products

- use Red Seal products used to challenge an Interprovincial examination
 - use coaching skills when training an apprentice
 - assess barrier free entrance system operation
 - assess automatic door operations
 - identify specialty products and emerging technologies in the glazing industry
-

Frame Systems 2

- install curtain wall systems
 - fabricate and install a multi-level curtain wall
-

Door Systems 2

- install specialty commercial doors
 - install and service specialty door hardware
 - fabricate and install a storefront frame system
-

Glazing and Service 4

- describe specialty glazing systems and their applications
 - install specialty glazing systems
 - install a building envelope system
-

Math and Drawing Interpretation 4

- generate a curtain wall shop drawing
 - interpret a commercial drawing
 - interpret project specifications
 - estimate labour and material quantities for a given project
 - manage an on-site commercial project
-