Area of Interest: Construction and Skilled Trades

Welding Techniques - Sheet Metal Worker Apprenticeship

Ontario College Certificate Program Code: 0526X01FWO

24 Weeks

Ottawa Campus

Our Program

Form a future as a journeyperson in the sheet metal industry.

Applicants to the Welding Techniques - Sheet Metal Worker Apprenticeship Ontario College Certificate program must:

- be currently employed in the trade
- be formally registered as apprentices with the Ministry of Labour, Training and Skills Development (MLTSD)
- have a valid Offer of Classroom Training from the Ministry of Labour, Training and Skills Development that includes your Ministry Client ID and approved Class Number

Eligibility is determined by the Ministry of Labour, Training and Skills Development.

This apprenticeship program provides sheet metal worker apprentices with the trade skills and theory necessary to design, assemble and install shop fabricated parts and fulfills the in-class requirements of the apprenticeship program.

Growth in the construction business and increasing emphasis on complete environmental control ensure a steady demand for sheet metal workers. Modern buildings require up-to-date heating, cooling and ventilation systems, many of which depend upon air movement to satisfy design conditions. Fans and connected sheet metal duct work are the heart of such systems.

The Sheet Metal trade is a compulsory skilled trade in Ontario, and requires a Certificate of Qualification to work in Ontario. For employment outside Ontario, a sheet metal worker must have a Red Seal Endorsement (RSE).

If you are considering a future as a sheet metal worker, you may find a career in the construction industry installing or fabricating duct work.

To learn more about apprenticeships, visit https://www.ontario.ca/page/skilled-trades for detailed information.

For Registered Apprentices: This program fulfills the in-class requirements for your apprenticeship. It is divided into three levels (Beginner, Intermediate, Advanced) where you alternate between going to class for 8-weeks and honing your skills through working in the field for 8 - 12 months. During your labs you learn the trade skills and theory to design, assemble and install shop fabricated parts. You also learn basic design concepts, drafting and blueprint reading, and welding practices.

At the end of this program, you qualify to write the exam for the Ontario College of Trades Certificate of Qualification, as well as the Red Seal Endorsement (RSE) exam, which is recognized across Canada.

SUCCESS FACTORS

This program is well-suited for students who:

- Enjoy a hands-on approach to learning about the sheet metal industry.
- Can work independently.
- Are self-reliant and enjoy challenges.

Employment

Graduates may find employment in the construction industry as sheet metal workers installing or fabricating duct work.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Perform work responsibly and in compliance with the Occupational Health and Safety Act.
- Interpret engineering drawings and blueprints and produce basic graphics as required by industry.
- Interpret blueprint drawings in accordance with industry approved welding symbols.
- Use layout and fabrication processes typical to the industry to determine correct form with accuracy.
- Select appropriate tools and devices to perform mathematical calculations and technical measurements for successful completion of a project.
- Perform welding applications utilizing current welding equipment, for metal fabrication and installation.
- Perform welding techniques according to industry standards.
- Create high quality welds on various types of materials and create joints in the flat, horizontal, vertical and overhead positions.
- Identify defect in welds, demonstrate how to prevent them and define procedures for correction of defective weld quality.
- Use Computer Aided Design/Computer Aided Machine (CAD/CAM) via plasma to cut out metal patterns for fittings used in the air distribution system field.
- Fabricate and install required metal components for architectural sheet metal.
- Measure, record and adjust air flow requirements in a Heating, Ventilation, and Air Conditioning (HVAC) system in order for it to operate under design conditions.

Program of Study

Level: 01 (Basic)	Courses	Hours
DRA1313	Lay-Out and Drafting 1	96.0
DRA1314	Read, Interpret and Produce Drawings	24.0
MET1311	Fabricates for Shop and Field	56.0
MET1312	Use and Maintain Hand and Power Tools and Shop Equipment	40.0
WEL8508	Weld and Cut 1	24.0
Level: 02 (Intermediate)	**Courses**	**Hours**
DRA1323	Lay-Out and Drafting 2	96.0

DRA1324	IntERPret and Design Systems 1	64.0
MET1321	Install Heating, Ventilation and Air Conditioning Systems and Components	24.0
MET1322	Install Roofing and Architectural Metal	32.0
WEL8512	Weld and Cut 2	24.0
Level: 03 (Advanced)	**Courses**	**Hours**
DRA1333	Lay-Out and Drafting 3	104.0
DRA1334	Interpret and Design Systems 2	40.0
MET1331	Test, Adjust and Balance	32.0
MET1332	Fabricate and Install Industrial Enviro. Systems and Specialized Installation	40.0
WEL8516	Weld and Cut 3	24.0

Fees for the 2024/2025 Academic Year

Tuition Fees: $400 per level.

Incidental Fee: $150 per level.

Information Technology Fee: $43.86 per level.

Books and supplies can be purchased at the campus store. Students are responsible for parking and locker fees, if applicable.

All students are responsible to supply and use their own personal protective equipment (such as CSA-approved safety footwear, non-tinted protective eyewear, hearing protection, gloves, hard hat) as required in each lab environment.

Admission Requirements for the 2025/2026 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program).

Program Eligibility

- Prospective students must be registered apprentices with the Ministry of Labour, Training and Skills Development and must be a member in good standing with Skilled Trades Ontario (STO).
- Eligibility is determined by the Ministry of Labour, Training and Skills Development.

Admission Requirements for 2024/2025 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program).

Program Eligibility

- Prospective students must be registered apprentices with the Ministry of Labour, Training and Skills Development and must be a member in good standing with Skilled Trades Ontario (STO).

Eligibility is determined by the Ministry of Labour, Training and Skills Development.

Application Information

WELDING TECHNIQUES - SHEET METAL WORKER APPRENTICESHIP
Program Code 0526X01FWO

Registration for Apprenticeship programs takes place through the Ministry of Labour, Training, and Skills Development.

For further information, contact:

Ministry of Labour, Training, and Skills Development
347 Preston Street 3rd Floor, Suite 310
Ottawa, ON K1S 3H8

https://www.ontario.ca/page/skilled-trades
Telephone: 613-731-7100
Toll-free: 1-877-221-1220

Contact Information

Program Coordinator(s)

- William Roberts, mailto:robertw@algonquincollege.com , 613-727-4723, ext. 6095

Course Descriptions

DRA1313 Lay-Out and Drafting 1

Apprentices learn how to select the appropriate lay-out tools and perform required geometry to produce patterns and fittings to required specifications. Developing and cutting accurate stretch out patterns and patterns for fittings, employing the parallel line method, radial line method and the triangulation method to required tolerances.

Prerequisite(s): none
Corerequisite(s):none

DRA1314 Read, Interpret and Produce Drawings

Apprentices accurately interpret drawings and specifications, produce free-hand sketches and detailed drawings using drafting equipment, templates and CAD systems to illustrate to others, work to be performed.

Prerequisite(s): none
Corerequisite(s):none

DRA1323 Lay-Out and Drafting 2

In a continuation of Layout and Drafting 1, apprentices develop and cut patterns accurately for fittings employing parallel line, radial line and triangulation.

Prerequisite(s): none
Corerequisite(s):none

DRA1324 IntERPret and Design Systems 1

Apprentices calculate and design complete heating ventilation and cooling systems and duct designs for residential applications including the cost estimate for a given job.

Prerequisite(s): none
Corerequisite(s):none

DRA1333 Lay-Out and Drafting 3

Apprentices develop and cut patterns for fittings requiring triangulation, employing the principal method of triangulation and using triangulation short cuts accurately to tolerances.

Prerequisite(s): none
Corerequisite(s):none

DRA1334 Interpret and Design Systems 2

Apprentices produce load estimates for commercial and industrial buildings and designs of commercial duct systems using the equal friction method. The completion of cost estimates for commercial and industrial jobs are also performed.

Prerequisite(s): none
Corerequisite(s):none

MET1311 Fabricates for Shop and Field

Apprentices select materials used in the trade as well as select the appropriate seams, connectors, edges and notches to diverse applications. Apprentices soft solder metals, using appropriate equipment to work safely and perform rigging operations that conform to Ontario Health and Safety Act (OHSA), Construction Safety Association of Ontario (CSAO) standards, Hoisting Engineers Act and industry safety procedures.

Prerequisite(s): none
Corerequisite(s):none

MET1312 Use and Maintain Hand and Power Tools and Shop Equipment

Focus is on having apprentices recognize and describe the operation of specialized shop equipment, as well as input information into computer related software. Apprentices demonstrate the ability to use hand and power tools effectively to perform sheet metal work in accordance with required tolerances. Apprentices learn to set up and operate bending equipment, manual forming and cutting equipment within limitations and capacities to produce products to required tolerances from drawings and specifications.

Prerequisite(s): none
Corerequisite(s):none

MET1321 Install Heating, Ventilation and Air Conditioning Systems and Components

Apprentices are trained to recommend installation procedures for a complete ducted and industrial duct system, including components, in accordance with manufacturer's specification and Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) specifications. Learning to distinguish the need for sound abatement and recommend installation techniques are also covered.

Prerequisite(s): none
Corerequisite(s):none

MET1322 Install Roofing and Architectural Metal

Apprentices are taught the recommended installation and fabrication procedures for various roof accessories. Apprentices also learn to identify, fabricate and install required flashing, metal roof and drainage systems for commercial and industrial buildings in accordance to Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) standards and specifications.

Prerequisite(s): none

Corerequisite(s):none

MET1331 Test, Adjust and Balance

Apprentices define the properties of air and their relationship to moisture for human comfort. This includes recommending installation and testing techniques required for air moving devices and the measurement, recording and adjusting of air flow to produce a balanced system.

Prerequisite(s): none
Corerequisite(s):none

MET1332 Fabricate and Install Industrial Enviro. Systems and Specialized Installation

Apprentices design an industrial material handling system using velocity reduction, describe techniques for installation and fabrication of industrial components and recommend installation procedures for grills, registers, diffusers and troughers to provide efficient air distribution according to Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) and manufacturer's requirements.

Prerequisite(s): none
Corerequisite(s):none

WEL8508 Weld and Cut 1

Welding is a skill essential to the sheet metal trade. Competent welding skills are developed at a basic level. Students are offered instruction in oxyacetylene welding (O.F.W.); safety precautions; gas cylinders and equipment; types and uses of flames and joints; the plasma cutting process; and the oxyacetylene cutting process. Apprentices are offered instruction and assistance in shielded metal arc welding (S.M.A.W.) safety, AC/DC power sources and use, identification and classification of electrodes and welding basic joints. Theory and practical instruction are offered in a lab setting.

Prerequisite(s): none
Corerequisite(s):none

WEL8512 Weld and Cut 2

Welding is a skill essential to the sheet metal trade. Competent welding skills are developed at an intermediate level. Apprentices are offered instruction and assistance in reviewing basic electric arc safety, inert gas, and selecting power sources. Apprentices are offered instruction in the set up and operation of gas metal arc welding (GMAW) equipment. Theory and practical instruction are offered in a lab setting.

Prerequisite(s): WEL8508
Corerequisite(s):none

WEL8516 Weld and Cut 3

Welding is a skill essential to the sheet metal trade. Competent welding skills are developed at an advanced level. Apprentices are offered instruction and assistance in reviewing electric arc safety, inert gas and the welding arc, and selecting power sources to complete a weld using gas tungsten arc welding (GTAW). Theory and practical instruction are offered in a lab setting.

Prerequisite(s): WEL8512
Corerequisite(s):none