

Fanshawe College

## FIRST: Fanshawe Innovation, Research, Scholarship, Teaching

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Documentation (Approval etc...)

Welding & Fabrication Technician

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2020

### FANS01379 Welding & Fabrication Technician CVS Application

Fanshawe College

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Ontario College Quality Assurance Service

Service de l'assurance de la qualité des  
collèges de l'Ontario

# Welding and Fabrication Technician

Validated

Description

Fanshawe College | APS # FANS01379 | MTCU # 54902  
Ontario College Diploma | Full-time funding requested

## Purpose

This program is designed to allow students to graduate with a skill set that meets the needs of the most current manufacturing environments. Students will enjoy a mix of theoretical and practical learning in Fanshawe's new state-of-the-art welding lab. The program features a significant amount of in-lab practice time to allow students to master their craft. Instruction will incorporate emerging technologies like virtual/augmented reality, robotics and pulse welding. Students will have the opportunity to enhance their employability by preparing for their Canadian Welding Bureau (CWB) certifications. A co-op work experience has also been incorporated into the program to augment students' career preparedness.

## Admission Requirements

Ontario Secondary School Diploma (OSSD) or equivalent, mature student status

## Occupational Areas

Welders and Related Machine Operators NOC 7237

Welders operate welding equipment to weld ferrous and non-ferrous metals. This unit group also includes machine operators who operate previously set up production welding, brazing and soldering equipment. They are employed by companies that manufacture structural steel and plate-work, boilers, heavy machinery, aircraft and ships and other metal products, and by welding contractors and welding shops, or they may be self-employed. In terms of general labour market demand, according to the

Careers Outlook Report, the median income for this NOC is \$50,501 and there are projected to be 4,000 – 5,000 new job openings in Ontario offered during the period of 2017 – 2021.

### Contractors and Supervisors, Machining, Metal Forming, Shaping and Erecting Trades and Related Occupations NOC 7201

This unit group includes sheet metal, ironwork, welding and boiler-making trade contractors who own and operate their own business. This group also includes supervisors who supervise and co-ordinate the activities of workers classified in the following unit groups: Machinists and Machining and Tooling Inspectors (7231), Tool and Die Makers (7232), Sheet Metal Workers (7233), Boilermakers (7234), Structural Metal and Plate-work Fabricators and Fitters (7235), Ironworkers (7236), Welders and Related Machine Operators (7237) and Machining Tool Operators (9417). They are employed by structural, plate-work and related metal products fabrication, manufacturing and erecting companies and machine shops. In terms of general labour market demand, according to the Careers Outlook Report, the median income for this NOC is \$73,447 and there are projected to be 1,000 – 2,000 new job openings in Ontario offered during the period of 2017 – 2021.

## Laddering Opportunities

This diploma program will be a pathway program for the 1-year Welding Techniques program offered by Simcoe, St. Thomas and Kincardine campuses. Graduates will also be eligible to challenge the first year curriculum of the Welding Techniques – Sheet Metal apprenticeship program. Graduates may also be able to receive credit toward further education in related advanced diploma or degree programs.

## Program VLOs

1. Employ tools, materials, supplies and applications appropriately to complete welding and fabrication projects in keeping with industry best practices and safety regulations
2. Interpret the essential elements and concepts of blueprints in order to apply these to the fabrication of welding pieces
3. Apply basic trade-related math concepts to complete welding and fabrication projects according to required specifications
4. Work in compliance with codes, standards and accepted principles and practices of the welding industry
5. Contribute to the management of welding/ fabrication projects by preparing accurate estimates of time and costs using appropriate project planning tools
6. Solve and correct basic welding problems through analysis and the application of other problem

solving tools and processes used in the welding/fabrication environment

7. Perform preventative maintenance related to welding materials, tools and equipment
8. Fabricate an item from initial sketches to completion and inspection according to given standards and tolerances

## Curriculum

- **MATH-XXX1 - Math for Welding**

> Semester 1 | 30 hours

Students are introduced to analytical skills typically required in a welding trade environment, with an emphasis on solving applied problems. Students explore concepts and operations involving whole numbers, fractions, decimals, exponents, roots and percent, ratio and proportion. Students learn through interactive lectures, demonstrations, and assignment work.

- **SFTY-XXX1 - Industrial Safety & Rigging**

> Semester 1 | 45 hours

Students learn how to work safely in a potentially dangerous environment. Specifically, they learn how to identify hazardous conditions and how to prevent work place accidents. Personal, workplace and welding machinery/equipment safety are emphasized throughout the course. Working at heights, fall restraint, confined space training and chain/sling rigging are a few of the focal points discussed.

- **DRAF-XXX1 - Introduction to Blueprint Reading**

> Semester 1 | 30 hours

This course is designed to provide students with the knowledge to interpret a variety of drawings and schematics typically found in a welding and fabricating environment. Emphasis is placed on drawing interpretation, basic drafting, sketching, and common welding symbols. Specifically, students learn the language of technical drawings including symbols, types of lines and welding symbols. They examine the standard form for orthographic projection, including how to interpret detailed engineering drawings.

- **WELD-XXX1 - Welding Theory 1**

> Semester 1 | 45 hours

This course introduces students to core theoretical models shared across multiple welding processes including: weld joint configuration, electrical terminology, and physics related to welding projects.

- **WELD-XXX2 - Practical Welding Lab 1**

> Semester 1 | 120 hours

Students are introduced to working in a welding environment in this hands-on lab setting.

Students will develop the skills to produce fillet and groove welds in the flat and horizontal positions using shielded metal arc welding (SMAW) and gas metal arc welding (GMAW) processes. Students will be prepared to the W47.1 standard as per the Canadian Welding Bureau.

- **GEN ED1 - General Education Course**

- > Semester 1 | 45 hours | *General*  
General Education Course

- **ACAD-XXX1 - Computer Aided Design**

- > Semester 2 | 30 hours

- This course introduces students to computer aided design. Students will learn to create basic two-dimensional drawings in AutoCAD.

- **WELD-XXX3 - Welding Theory 2**

- > Semester 2 | 45 hours

- Welding Theory 2 will build on lessons from content learned in Welding Theory 1. Students continue to study welding techniques, machine functions, electrodes, effects of shielding gases, types of filler wires and wire transfer methods.

- **WELD-XXX4 - Metallurgy Fundamentals**

- > Semester 2 | 30 hours

- This course of study introduces students to the study of ferrous metals and their alloys used in industry.

- **WELD-XXX5 - Practical Welding Lab 2**

- > Semester 2 | 120 hours

- Practical Welding Lab 2 builds on students' skills and knowledge established during Practical Welding Lab 1. Students will also continue to hone their skills using GMAW and SMAW to become competent in completing tasks in vertical and overhead positions. In this lab, Carbon Air Arc will also be introduced. Students will be prepared to the W47.1 standard as per the Canadian Welding Bureau.

- **COOP-1020 - Preparation for Co-op Work Study**

- > Semester 2 | 6 hours

- This workshop will provide an overview of the Co-operative Education consultants and students' roles and responsibilities as well as the Co-operative Education Policy. It will provide students with employment preparatory skills specifically related to co-operative education work assignments and will prepare students for their work term

- **Co-op - Co-op Work Term**

- > Semester 3 | 420 hours

- Co-op Work Term

- **MATH-XXX2 - Trade Calculations**

- > Semester 4 | 30 hours

- This course builds on work-related math skills introduced in Math for Welding and will include

basic algebraic techniques, geometric theorems involving angles and triangles, units of measurement and application of formulas, tables and charts to determine perimeter, area, volume, weight and bending allowance.

- **DRAF-XXX2 - Blueprint – Structural & Pipe**

- > Semester 4 | 45 hours

- This course is designed to further the students' knowledge by introducing symbols and line types in drawings that are associated with working in pressure fitting applications and piping of low/high pressures. Through lecture and individual/team projects, students become adept with reading larger working blueprints.

- **WELD-XXX6 - Welding Theory 3**

- > Semester 4 | 45 hours

- Welding Theory 3 will cover the function of and equipment related to gas tungsten arc welding and flux core/metal core advanced functions. Theory related to pressure fitting and pipe welding will also be taught and applied.

- **WELD-XXX7 - Practical Welding Lab 3**

- > Semester 4 | 120 hours

- Students will advance their skills by being introduced to the gas tungsten arc process in Practical Welding Lab 3. Students perform fillet and groove welds on varied types and thicknesses of metals in multiple positions. Flux core /metal core process will also be covered.

- **GEN ED2 - General Education Course**

- > Semester 4 | 45 hours | *General*

- General Education

- **WELD-XXX8 - Metallurgy for Welders**

- > Semester 4 | 30 hours

- In this course, students investigate properties of different steel and the effects of stress and heating. They will learn testing and inspection procedures related to the welding industry. Identification of discontinuities is also highlighted.

- **PRJT-XXX1 - Project Planning**

- > Semester 5 | 30 hours

- This course is designed to offer students a better understanding of the process behind producing products from start to finish. Students will progress from initial design to drawing to costing and fabrication. They will adhere to proper procedures, codes and standards. This course will also focus on project planning from an entrepreneurial perspective, with a view to skills/attitudes required to create and maintain a small business.

- **WELD-XXX9 - Fabrication Lab**

- > Semester 5 | 45 hours

- In this course, students will be tasked with submitting plans for a practical capstone project.

- Students select proper materials and process and perform the necessary operations to bring the

fabrication project to its completion.

- **WELD-XX10 - Practical Welding Lab 4**

> Semester 5 | 120 hours

Practical Welding Lab 4 introduces students to pipe and pressure vessel welding techniques

- **WELD-XX11 - Robotics & Weld**

> Semester 5 | 30 hours

This course offers students the opportunity to learn basic programming and operation of multi axis automated welding robots. Students work in a safe controlled robotic cell, learning communication and welding commands needed to operate today's high production equipment.

- **GEN ED3 - General Education Course**

> Semester 5 | 45 hours | *General*

General Education

## VLO Mapping

	VLO 1	VLO 2	VLO 3	VLO 4	VLO 5	VLO 6	VLO 7	VLO 8
MATH-XXX1			X					
SFTY-XXX1	X			X				
DRAF-XXX1		X						
WELD-XXX1				X	X	X		
WELD-XXX2	X		X	X		X		
GEN ED1								
ACAD-XXX1		X		X				
WELD-XXX3				X	X	X		
WELD-XXX4						X		
WELD-XXX5	X		X	X		X	X	

	VLO 1	VLO 2	VLO 3	VLO 4	VLO 5	VLO 6	VLO 7	VLO 8
COOP-1020				X				
Co-op	X	X	X	X		X		
MATH-XXX2			X		X	X		
DRAF-XXX2		X		X				
WELD-XXX6				X		X	X	
WELD-XXX7	X	X	X	X		X	X	X
GEN ED2								
WELD-XXX8	X							
PRJT-XXX1					X			
WELD-XXX9		X	X	X		X		X
WELD-XX10						X		
WELD-XX11	X	X	X	X		X	X	X
GEN ED3								

## EES

1. Communication: a) Reading, b) Writing, c) Speaking, d) Listening, e) Presenting, f) Visual literacy. 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. Communication: a) Reading, b) Writing, c) Speaking, d) Listening, e) Presenting, f) Visual literacy. 2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Numeracy: a) Understanding and applying mathematical concepts and reasoning, b) Analyzing and using numerical data, s) Conceptualizing 3. Execute mathematical operations accurately.







	EES 1	EES 2	EES 3	EES 4	EES 5	EES 6	EES 7	EES 8	EES 9	EES 10	EES 11	EES 12	EES 13
WELD-XX11	X	X	X	X	X	X	X	X	X	X	X		
GEN ED3													

## Certification/Accreditation

### Certification type

Voluntary recognition of a regulatory authority is being sought.

### Recognition by Voluntary Association

**Name of voluntary association:** Canadian Welding Bureau (CWB)

### Status

- Recognition has been received.

**Date of recognition:** 10/25/2019 renewed annually

**Type of recognition (e.g. accreditation, graduates eligible to write membership exams, etc.):**

Fanshawe facilities and faculty certified to administer exams to test student achievement of CWB Welding Standards

## Contact Information

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