

Metal Fabrication Technician

Section B.134

9/18/2020

Ontario College Diploma (2 Years - 4 Semesters) (4051)

705.759.6700 : 1.800.461.2260 : www.saultcollege.ca : Sault Ste. Marie, ON, Canada



PROGRAM OVERVIEW

The Metal Fabrication Technician (welder-fitter) program at Sault College will provide you with the thorough knowledge and understanding needed in the fields of welding and fabricating. The first year of this two-year program concentrates on covering welding techniques, while the second year focuses on more in-depth knowledge related to how to build structures made of metal. During your education, you will be taught how to safely and effectively lay out and then build the parts needed for large projects like bridges, buildings, towers and platforms. You will also learn how to construct and repair steel stairs, boilers, tanks, chutes, hoppers, stacks, and other assemblies and steel structures. Skilled instructors will teach you how to successfully plan interesting projects, quote the costs of materials needed, and use state-of-the-art equipment to make parts for projects with varying degrees of difficulty and assemble them.

If you are a Canadian citizen or permanent resident and currently unemployed, you may qualify for second career funding for this program! To learn more about your options and how to get started, contact us at studentrecruitment@saultcollege.ca.

PROGRAM OUTCOMES

A graduate of the Metal Fabrication Technician Program at Sault College will reliably demonstrate the ability to:

1. Interpret blueprints and produce basic drawings and bills of materials.
2. Apply knowledge of various welding and metal cutting techniques and theories to produce components and sub-assemblies.
3. Prepare materials by utilizing fabrication machinery and equipment.
4. Create and use patterns and templates using common layout and measuring tools.
5. Understand and use a variety of destructive and non-destructive methods to test welds.
6. Develop project plans relating to component and sub-assembly production.
7. Complete all work in compliance with health and safety legislation and prescribed organizational practices and procedures to ensure safety of self and others.
8. Work responsibly and effectively in accordance with government safety regulations, manufacturers recommendations and approved industry standards.

ADMISSIONS

MINIMUM ACADEMIC REQUIREMENTS

Ontario Secondary School Diploma, or mature student status.

CAREER PATHS

As a successful graduate of our Metal Fabrication program, you may find work in a wide range of exciting places of employment across the globe or close-to-home.

Small and large construction and manufacturing industries continually seek out metal fabricators (welder-fitters) to join their teams.

After you have successfully learned with us, you will be able to:

- perform a large number of welding processes and metal-cutting techniques safely, including stick/shielded metal arc welding, mig/gas-metal arc welding, and tig/gas-tungsten arc welding, among others;
- interpret and develop drawings, field sketches, project plans, and bills of materials for welding projects following codes and specifications;
- understand and use a variety of methods to test welds;
- apply knowledge of various welding and metal cutting techniques and theories to produce components and sub-assemblies;
- create and use patterns and templates using layout and measuring tools and techniques; and
- prepare materials by using cutting-edge computer numerically-controlled (CNC) equipment.

Once you have successfully completed your studies, you may have the opportunity to test on-site with the Canadian Welding Bureau (CWB) for your welding performance qualifications/certified ticket at an additional cost to you.

MANDATORY FEES

Domestic		International	
Tuition	Ancillary	Tuition	Ancillary
\$2,716.50	\$1,017.00	\$15,180.80	\$1,477.00

These fees are for the 2020-2021 academic year (year 1 of study) and are subject to change. Please visit your Student Portal to view your Schedule of Fees.

PROGRAM OF STUDY

SEMESTER 1

CMM149-3 Practical Communications I
 MTF101-3 Applied Blueprint Reading
 MTF102-3 Welding Theory 1
 MTF105-2 GAS Shielded Semi-Automatic Welding 1
 MTF107-4 Shield Metal Arc Welding I
 MTF108-2 Trade Practices
 MTF109-2 Oxy Fusion and Braze Welding

SEMESTER 2

MTF131-3 Fabrication 1
 MTF132-2 GAS Tungsten Arc Welding (GTAW) 1
 MTF133-2 Machine Operations
 MTF137-3 Shielded Metal Arc (SMAW) Welding 2
 MTF139-1 Thermal Cutting
 MTF140-3 Blueprint Reading - Advanced
 MTF141-3 Materials and Process Quality
 MTF142-3 Semiautomatic Welding

SEMESTER 3

MTF201-5 Fabrication 2
MTF207-2 Pattern and Template Development 1
MTF209-3 Project Planning and Installation
MTF210-2 Shielded Metal Arc Welding - Advanced
MTF211-5 Assembly and Fabrication of Detailed Components
GEN100-3 Global Citizenship

SEMESTER 4

MTF235-3 Pattern and Template Development 2
MTF236-8 Field Fitting and Layout
MTF237-2 Automated Cutting
MTF238-2 Blueprints and Patterns
TNY130-3 Technology in Society

Select one of the following:

GEN110: Student Selected General Education

Note: *This student-selected general education course code indicates a general-education course is taken in this semester. Students will choose from a selection of courses ([details](#)) prior to the semester in which the student-selected general education course is to be taken.

Course Descriptions

Semester 1

Practical Communications I (CMM149) (3 credits)

This course helps students develop reading, writing, listening, and speaking skills required for various apprenticeship and certificate programs. Practical program-related assignments assist students to acquire the essential skills for their field. As well, students prepare current job-search documents. The principles of writing are taught through the writing process.

Applied Blueprint Reading (MTF101) (3 credits)

Perform drawings, common views, and basic drafting and sketching operations as applied to the welder/fabricator programs.

Welding Theory 1 (MTF102) (3 credits)

Describe the functions and controls of welding power sources in accordance with government safety regulations, manufacturer's recommendations and approved industry standards.

GAS Shielded Semi-Automatic Welding 1 (MTF105) (2 credits)

Describe the fundamentals, construction features and consumables of the Gas Metal Arc Welding (GMAW) process in accordance with government safety regulations, manufacturer's recommendations and approved industry standards.

Shield Metal Arc Welding I (MTF107) (4 credits)

In this course, students are taught the processes of shielded metal arc welding (SMAW), including how to safely set up, use and maintain equipment operated in this type of welding. It will also cover how to select filler metals/electrodes needed to suit base metal for welding. Proper techniques on how to weld in the flat and horizontal positions are also developed throughout the course.

Trade Practices (MTF108) (2 credits)

This course helps students develop trade math skills related to welding. It offers a review of basic operations with topics covered including whole numbers, fractions and decimals, and progresses through

measurements, area and volume calculations, and angular development, to finish with a section on bends, stretch-outs, economical layout, and take-offs

Oxy Fusion and Braze Welding (MTF109) (2 credits)

This course teaches students how to safely set up Oxyfuel equipment, how to safely use the equipment, torch cut various thickness of metal materials, fusion weld with or without filler metal, and braze. Techniques needed to weld and cut, will develop hand eye skills required to be a welder.

Semester 2

Fabrication 1 (MTF131) (3 credits)

Plan and perform practical fitting projects in accordance with government safety regulations, manufacturer's recommendations, and approved industry standards.

GAS Tungsten Arc Welding (GTAW) 1 (MTF132) (2 credits)

Perform welding procedures using Gas Tungsten Arc Welding (GTAW) process in accordance with government safety regulations, manufacturer's recommendations, and approved industry standards.

Machine Operations (MTF133) (2 credits)

Use fabrication equipment for forming plate and structural shapes in accordance with government safety regulations, manufacturer's recommendations, and approved industry standards.

Shielded Metal Arc (SMAW) Welding 2 (MTF137) (3 credits)

Perform CWB T class 1G, 2G (Flat and horizontal open root) positions, in accordance with government safety regulations and approved industry standards with a focus of meeting or exceeding the CAS test requirements.

Thermal Cutting (MTF139) (1 credits)

In this course, students will learn the equipment and skills behind a number of main thermal cutting processes, including Plasma Arc Cutting and Air Carbon Arc Cutting. A review and more detailed cuts using Oxyfuel cutting is also included in the course.

Blueprint Reading - Advanced (MTF140) (3 credits)

This course builds upon the skills developed in the first level of blueprint reading. Students will learn more in-depth practices related to the reading of Isometric and orthographic blueprints and complex drawings of structures needing to be built, repaired or modified, that involve welding and fitting.

Materials and Process Quality (MTF141) (3 credits)

This course deals mainly with how metals are affected by welding. To be a competent welder, a good understanding of the materials being welded is needed as well as the processes and procedures required to produce sound, reliable welds. A thorough study of the mechanical and physical properties of metals is then followed by presentations that explain how metals are affected by forming and the application of welding heat. Safety precautions will be discussed, along with welding codes and standards. Topics range from Welding Metallurgy and Weldability of Metals to Testing and Inspection of Welds and Welder Certification.

Semiautomatic Welding (MTF142) (3 credits)

This course will cover the continuation of Gas Metal Arc Welding, equipment, set-up and a variation of gases as well as completing the two remaining positions: vertical and overhead welding. It will also cover the skills involved with welding Metal Core and Flux Core Arc Welding.

Semester 3

Fabrication 2 (MTF201) (5 credits)

Prepare fabrication and detail materials by utilizing machinery and equipment in accordance with government regulations, manufacturer's recommendations and specifications, and approved industry standards.

Pattern and Template Development 1 (MTF207) (2 credits)

This course takes students through a step-by-step process on accurately laying out a template to be used for accurately completing projects. Techniques for the coping, bending, and rolling of metals are all covered. Each template is created using drafting and blueprint-reading skills for appropriately-sized templates as they relate to specific material size.

Project Planning and Installation (MTF209) (3 credits)

This course will teach students how to map out the requirements needed for the successful implementation of projects. A variety of jobs will be presented including both small and large or complex ones will be covered. Student will develop skills in material estimates required for projects, as well as timeline and labour resource estimates, including the number of hours required to complete jobs undertaken. Pre-job planning for installations in the field or on-site will also be covered.

Shielded Metal Arc Welding - Advanced (MTF210) (2 credits)

This course revisits the skills presented in introductory-level courses involving shielded metal arc welding. It provides students with additional time in the shop to finish projects they may have started in the first two courses, with a focus on reinforcing the skills they have learned so that their applied skills are strengthened. Once students demonstrate mastery of these basic techniques, they will be introduced to t-class open route welding of plates as well as begin working on pipe welding.

Assembly and Fabrication of Detailed Components (MTF211) (5 credits)

In this course, students will build small, intricate projects that use various methods of connections as well as detailed lay-out and fitting to better understand the complexity of structures. A variety of tacking techniques as well as methods of forming and bending various structural materials working off of complex blueprints is also covered.

Global Citizenship (GEN100) (3 credits)

The world we are living in is one in which local, national and international issues are interwoven, and the need for us to understand the impact these issues can have on our lives has never been greater! Using a socio-cultural, political and environmental lens, students will view how the world is changing and how to become active agents of change from the local to international level. Important issues such as social injustice, poverty, environmental protection, resource scarcity, sustainability, and health will be addressed. Global citizenship is an opportunity to `Be the Change`. This course meets the Civic Life and Social and Cultural Understanding General Education themes.

Semester 4

Pattern and Template Development 2 (MTF235) (3 credits)

In this course students will be taught how to develop and layout templates and patterns, through the interpretation of drawings, using common layout and measuring tools, applying shop formulas and performing calculations to ensure the accuracy and functionality to meet the tolerances specified in the blueprints and specifications of the manufactured item.

Field Fitting and Layout (MTF236) (8 credits)

This course is designed to incorporate all skills that students have obtained in Fabrication 1 & 2 demonstrate the skills to assemble various structures using bending, forming, shaping, tacking and welding procedures. Students will also take the role of a business and will be required to receive a verbal order, provide cost of job, submit the required materials, build entire assembly and produce full blueprints for all parts required.

Automated Cutting (MTF237) (2 credits)

Students will be learning top of the line CNC (Coordinate Numerical Controlled) equipment as well as coordinate drive track cutter. Each will be taught how to properly operate desk CNC software, complete start-up sequence, verify material and plasma components to produce quality parts.

Blueprints and Patterns (MTF238) (2 credits)

Students are to use skills developed in applied blueprint reading and Advanced Blueprinting classes, to produce a complete drawing package. Drawings to include Assembly, Shop prints, detailed views of each component and field sketches overall material and cutting list. This complete set of drawings will correspond to the individual shop project students are to build in Field Fitting and Layout.

Technology in Society (TNY130) (3 credits)

This course will introduce students to the impact that technological change has on society. Illustrations and examples will be drawn from the students discipline. Potential topics include the social and economic impact of new technology, responsibilities and ethics, privacy, liability and technology-based crime, and emerging trends.

It is designed to provide students from varied programs and backgrounds with a particularly relevant and timely appreciation of the impact technology and technological advances have made on every aspect of society. Technology and its implementation in society have strengths, weaknesses, opportunities and threats. This course investigates the social, legal, and ethical issues the use of technology raises.

Student Selected General Education (GEN110) (3 credits)

For Transfer Credit Purposes only.