

We acknowledge and respect that we are gathered on the traditional lands of the Anishnaabe People of Turtle Island and proudly recognize our local host Atikameksheng Anishnawbek. We also recognize the contributions of Wahnapiatae First Nation and the Metis Nation of Ontario.

|               |  |               |   |               |         |
|---------------|--|---------------|---|---------------|---------|
| Course Title  | Welding I  |               |   |               |         |
| Course Code:  | WLD1100  | Credit Value: | 2 | Credit Hours: | 28      |
| Programs:     | IMTN Mechanical Engineering Technician - Industrial Mai<br>UNDL Undeclared |               |   |               |         |
| Equivalencies |  | Prerequisites |   | Corequisites  | GOM1143 |

This course may be delivered in a variety of different formats: 100% in-class, 100% online (or a blend of both), videoconferencing, distributed learning or off-campus. Please confirm with your faculty member which format will be used for your section of this course.

General Education Course:  Eligible for PLAR:   
 Degree Breadth Course:  Experiential Learning:   
 Research Intensive Course Designation:

**COURSE DESCRIPTION**

In this course, students will develop an understanding of the proper operation and theory associated with shielded metal arc welding equipment, proper use of protective equipment as well as demonstrate the skills required to perform welding and fabrication operations to industry standards.

Date: May 13, 2025

Approved by:   
 KIM CRANE  
 Dean, Skilled Trades, Engineering  
 Technology And Environmental Studies

Effective: Fall 2025, Winter 2026, Spring 2026

**RELATIONSHIP TO PROGRAM VOCATIONAL LEARNING OUTCOMES**

| <b>PROGRAM LEVEL</b>   |  |
|--|--|
| This course contributes to your program by allowing you to demonstrate the following vocational learning outcomes: |  |
| <b>Program(s)</b>  | <b>Vocational Learning Outcomes</b>  |
| Mechanical Engineering Technician - Industrial Mai   | <p><b>Ministry Standards</b></p> <ol style="list-style-type: none"> <li>1. Complete all work in compliance with current legislation, standards, regulations and guidelines.</li> <li>2. Apply quality control and quality assurance procedures to meet organizational standards and requirements.</li> <li>3. Comply with current health and safety legislation, as well as organizational practices and procedures.</li> <li>4. Apply sustainability best practices in workplaces.</li> </ol> |

**COURSE CURRICULUM**

**Topics/Concepts Covered in This Course**

- P.P.E. & Safety
- Shielded Metal Arc Welding
- Electrode Selection
- Joint Types
- Fillet Welding Symbols
- Layout, Tacking and Fabrication of Weldments
- Fabrication procedures

| <b>COURSE LEVEL: Learning Outcomes and Objectives</b>                          |  |
|--|--|
| To earn credit for this course, you must reliably demonstrate your ability to: |  |
| <b>Learning Outcome</b>  | <b>Objectives</b>  |
| 1. Select and use proper safety equipment and apparel.                         | <ol style="list-style-type: none"> <li>1.1 Describe and identify safety glasses, cutting goggles, welding helmet, hearing protection and all appropriate safety equipment.</li> <li>1.2 demonstrate the proper use of safety glasses, cutting goggles, welding helmet, hearing protection and all appropriate safety equipment.</li> </ol> |
| 2. Identify and describe arc welding electrodes.                               | <ol style="list-style-type: none"> <li>2.1 Identify E4918, E4311, E4310 and E4313 electrodes.</li> <li>2.2 Describe how to store, handling and properly use E4918, E4311, E4310 and E4313 electrodes.</li> </ol>   |
| 3. Define arc welding terms.   | <ol style="list-style-type: none"> <li>3.1 Describe AC/DC machines, types of current &amp; polarity, proper settings.</li> </ol>   |
| 4.   | <ol style="list-style-type: none"> <li>4.1 Identify the different types of joints.</li> </ol>  |

| Learning Outcome   | Objectives   |
|--|--|
| Describe the five different types of weld joints used in the fabrication industry.   | 4.2 Demonstrate an understanding of the different procedures for plate edge preparation.<br>4.3 Identify and explain the different fabrication processes.  |
| 5. Interpret fillet welding symbols to meet industry standards.  | 5.1 Select and identify welding symbols.<br>5.2 Identify the basic joint types, edge preparations, effective throat, reference lines and field welds.  |
| 6. Set up and operate Shielded Metal Arc Welding equipment to produce clean sound welds of sufficient quality to pass visual inspection. | 6.1 Demonstrate Shielded Metal Arc Welding in the flat and horizontal positions.<br>6.2 Describe and demonstrate the proper machine set up for S.M.A.Welding<br>6.3 Explain and apply proper electrode usage, polarity and amperage settings.<br>6.4 Develop an understanding of proper selection and use of safety equipment and apparel.<br>6.5 Select proper electrode types and diameters to suit the material and position. |

**Essential Employability Skills**

**Communication**

- communicate clearly in written, spoken, and visual form that fulfills purpose/needs of audience.
- respond to written, spoken, or visual messages in a manner that ensures effective communication.

**Numeracy**

- execute mathematical operations accurately.

**Critical Thinking and Problem Solving**

- apply a systematic approach to solve problems.
- use a variety of thinking skills to anticipate and solve problems.

**Information Management**

- locate, select, organize, and document information using appropriate technology and info systems.
- analyze, evaluate, and apply relevant information from a variety of sources.

**Interpersonal**

- show respect for the diverse opinions, values, belief systems, and contributions of others.
- interact with others in groups in ways that contribute to effective working relationships.

**Personal**

- manage the use of time and other resources to complete projects.
- take responsibility for one's own actions, decisions, and consequences.

**Delivery Method**

- Classroom: Course is delivered through scheduled synchronous teaching that may be face-to-face and/or virtual.

## **Learning Activities**

- Class Discussions
- Labs
- Self-Directed Learning
- In-Class Exercises
- Small Group Instruction
- One-to-One Instruction
- eLearning Components

## **Resources Required**

### **Additional Supplies**

Combination square  
Estimated Cost: \$50-\$200

Tape measure  
Estimated Cost: \$15

Welding Shield  
Estimated Cost: 20-\$60

Chipping Hammer  
Estimated Cost: 10

Wire brush  
Estimated Cost: \$15

Ball peen hammer  
Estimated Cost: \$30

Tape Measure  
Estimated Cost: 15

Proper clothing  
Estimated Cost: \$50-\$100

Workboots - 8" high, steel toe, CSA approved  
Estimated Cost: \$100-\$300

Wire Brush  
Estimated Cost: 15

Welding Gloves  
must be in good shape and free of holes and rips. Gauntlet style welding gloves  
Estimated Cost: \$15-\$30

Ball Peen Hammer  
Estimated Cost: 30

CSA approved safety glasses  
Estimated Cost: \$10

CSA Approved Safety Glasses  
Clear Lenses Only as per Safety Policy  
Estimated Cost: 25

Proper Clothing  
approved welding clothing, no rayon or track pant material that will melt. Jeans must be fray free and hole free  
Estimated Cost: \$200-\$400

Welding gloves  
Estimated Cost: \$15

CSA Approved Work Boots  
Boots will be laced to the top with pants over boots. 8" high boots only as per Safety Policy  
Estimated Cost: \$100-\$300

Vise Grips, Clamps Or Pliers  
These are required to carry hot metal pieces.  
Estimated Cost: \$40-\$80

Chipping hammer  
This is an important document and should be saved for future reference. It may be  
Estimated Cost: \$10  
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Combination Square  
Estimated Cost: \$50-\$200

Vise grips, clamps, or pliers

**Evaluation Plan**

**Grading Scheme**

|   |            |
|---|------------|
| A | 80% - 100% |
| B | 70% - 79%  |
| C | 60% - 69%  |
| F | 0% - 59%   |

| <b>Evaluation Method</b>   | <b>Value (%)</b> |
|--|------------------|
| <b>Assignments</b>   | <b>32%</b>       |
| <p>4 On-line assignments equally weighted Worth 32%</p> <p>Note! Each of the required assignments will be given a date of completion and must be completed within that time frame. Moodle assignments will not be reopened after they have been closed</p> <p>The Safety Assignment must be completed prior to entry into the welding lab. Assignments not completed by the due date will receive a grade of Zero.</p> |                  |
| <b>Applied Activities (G)</b>  | <b>55%</b>       |
| <p>There will be 5 Shielded Metal Arc Welding projects.</p> <p>#1 9" stringers 10%</p> <p>#2 6"X9" pad of beads 20%</p> <p>#3 12" fillet Flat 20%</p> <p>#4 12" Horizontal fillets 20%</p> <p>#5 12" Groove w/backing 30%</p> <p>Students will be required to have all of their tools and PPE as listed in the resources section of the course outline prior to entry into the lab.</p>                                |                  |
| <b>Test/Exam</b>   | <b>8%</b>        |
| <p>Final exam. Worth 8%.</p>   |                  |
| <b>Professional Conduct</b>  | <b>5%</b>        |
| <p>Professional conduct throughout the semester will count towards the determination of your final grade.</p> <p>This mark is based on preparedness for classes, interaction with peers / faculty, adherence to safety requirements / policies, and overall professionalism in the lab.</p>  |                  |

**ADDITIONAL INFORMATION**

A course outline is the College's commitment to the students. It supports educators, students, employers and other external stakeholders in determining the depth of knowledge and level of performance that a student will be able to demonstrate upon successful completion of a course. Both instructor and student are obligated to follow the content of the course outline. It is your responsibility to meet these outcomes as assigned.

**Note:** You should maintain a copy of this course outline for your records. You may require this course outline if you seek transfer credits or further studies at other institutions.

## Cambrian Email Addresses

All email correspondence with currently registered students must be via the students' College-issued email, as per the College's [IT Acceptable Use Policy](#). Students must familiarize themselves with the IT Acceptable Use Policy, as it outlines the acceptable use of College information systems and technology, and mitigates risks to the College's IT infrastructure.

## Bring Your Own Device (BYOD) and Apps Anywhere

Cambrian College is a BYOD institution, which means that students bring the device of their choice that meets program-specific minimum requirements. Program-specific requirements can be viewed in the "Plan Your Future" section on program web pages. AppsAnywhere is an easy-to-use app store-like platform providing students a way to access their College apps and software on demand, anywhere, anytime both on and off campus.

These both enrich the student learning experience in and out of the classroom, while providing maximum flexibility.

## Policies

It is the student's responsibility to be aware of the College's [Academic Policies](#). The Academic Policies apply to all applicants to Cambrian and all current students enrolled in any program or course offered by Cambrian, in any location. Academic policies, procedures, and forms can be found on the Cambrian website.

## Academic and Student Services

Cambrian has a variety of student and academic services to support students during their academic journey at the College.

- [Academic Success Centre](#)
- [Bookstore and Campus Store](#)
- [International Student Support Services](#)
- [KPMG Pride Centre](#)
- [Career Centre](#)
- [Registrar's Office \(Enrolment Centre\)](#)
- [First Step Centre](#)
- [Accessibility Services](#)
- [Library](#)
- [Pathways](#)
- [Available Scholarships and Bursaries](#)
- [Cambrian Student Council \(CSC\)](#)
- [Cambrian Indigenous Student Circle \(CISC\)](#)
- [Cambrian Athletic Association \(CAA\)](#)
- [Student Life Centre](#)
- [Test Centre](#)
- [The Learning Centre \[Tutoring Services\]](#)
- [Wabnode Centre for Indigenous Services](#)
- [Women's Resource Centre](#)

## Copyright

Copyright is the exclusive legal right given to a creator to reproduce, publish, sell, or distribute his/her work. All members of the Cambrian community are required to comply with Canadian copyright law, which governs the reproduction, use and distribution of copyrighted materials. This means that the copying, use and distribution of copyright-protected materials, regardless of format, are subject to certain limits and restrictions. For example, photocopying or scanning an entire textbook is prohibited, nor is uploading class materials to course sharing sites.

See the [Cambrian Library website](#) for additional information regarding copyright and for details on allowable limits.

### **Audio/Visual Capture**

Sounds and images from this class, and contributions made by a participant, virtually or in-person, are recorded under the authority of the Ontario Colleges of Applied Arts and Technology Act, 2002. The main purpose of these recordings is to allow students enrolled in the course to review content and engage in activities, whether they attend any given class in person, virtually, or at all. Class recordings are for personal use only and shall not be shared or transferred. Faculty may also review these recordings to prepare for future classes, evaluate students, collaborate in program reviews, or provide feedback to faculty and/or students. Any questions about the use of multimedia recordings may be addressed to your respective Dean.

### **Equity, Diversity, and Inclusivity**

Cambrian is committed to building and preserving an equitable, diverse, and inclusive learning community where students, faculty, and staff may achieve their full potential in an environment characterized by equality of respect and opportunity. All students and employees have the right to live and work in an environment that is free from discrimination and harassment. Therefore, Cambrian College will not tolerate any form of discrimination or harassment in its employment, education, accommodation, or business dealings. For more information, please visit: [Equity, Human Rights, and Accessibility](#).

### **Prior Learning Assessment and Recognition (PLAR)**

Students wishing to have work or life experience that meets course learning outcomes considered for credit through Prior Learning Assessment and Recognition should contact the [Pathways Office](#).

### **Transfer Credit**

Students wishing to have courses from other programs or institutions assessed for equivalency and/or transfer credit should visit the [Transfer Credits page](#) on the Cambrian website. The student should maintain a copy of this course outline for their records. Students may require this course outline if seeking transfer credits or further studies at other institutions.

### **Test Proctoring at Cambrian**

Many courses include major tests and/or final exams. The practice at Cambrian requires that these types of test situations involve proctoring to ensure academic integrity. Online tests/exams may employ a proctoring services to enable you to take your exam from a location of your choosing within a period specified by your instructor. When you are taking an online test/exam, the proctoring service may capture your video, screen, audio, and web surfing data to protect academic integrity. Cambrian College collects, uses, discloses, and retains personal information in compliance with the Freedom of Information and Protection of Privacy Act (FIPPA). Your personal information is being collected under the authority of the Ontario Colleges of Applied Arts and Technology Act S.O. 2002, c.8, Sched. F. This information will be used for the purpose of administering a test/exam through an online proctoring service acting as an authorized agent of the College. Please refer to Cambrian's [Official Student Records Policy](#) for more details. If you have any questions regarding the collection of your personal information, please contact Vice President Academic, Cambrian College, 1400 Barry Downe Rd., Sudbury ON P3A 3V8, 1-705-566-8101 ext. 6245.