



## COURSE OUTLINE: MTF132 - GTAW WELDING 1

Prepared: Dave Holley

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	MTF132: GAS TUNGSTEN ARC WELDING 1
<b>Program Number: Name</b>	4051: METAL FABRICATION 4053: WELDING TECHNIQUES
<b>Department:</b>	IRONWKR APPR./WELDING RELATED
<b>Semesters/Terms:</b>	22W
<b>Course Description:</b>	Perform welding procedures using Gas Tungsten Arc Welding (GTAW) process in accordance with government safety regulations, manufacturer recommendations, and approved industry standards.
<b>Total Credits:</b>	2
<b>Hours/Week:</b>	2
<b>Total Hours:</b>	30
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<p><b>4051 - METAL FABRICATION</b></p> <p>VLO 2 Apply knowledge of various welding and metal cutting techniques and theories to produce components and sub-assemblies.</p> <p>VLO 3 Prepare materials by utilizing fabrication machinery and equipment.</p> <p>VLO 5 Understand and use a variety of destructive and non-destructive methods to test welds.</p> <p>VLO 7 Complete all work in compliance with health and safety legislation and prescribed organizational practices and procedures to ensure safety of self and others.</p> <p>VLO 8 Work responsibly and effectively in accordance with government safety regulations, manufacturer's recommendations and approved industry standards.</p> <p><b>4053 - WELDING TECHNIQUES</b></p> <p>VLO 1 Perform work responsibly and in compliance with the Occupational Health and Safety Act.</p> <p>VLO 3 Recognize and understand use of welding symbols.</p> <p>VLO 6 Perform weld applications utilizing Shielded Metal Arc (SMAW), Flux Core (FCAW) and Gas Metal Arc (GMAW Mig Welding) welding equipment.</p> <p>VLO 7 Use welding techniques according to industry standards.</p> <p>VLO 8 Create high quality welds on various types of materials and create joints in the flat, horizontal, vertical and overhead positions.</p> <p>VLO 9 Identify defect in welds, demonstrate how to prevent them and define procedures for correction of defective weld quality.</p>
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.



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<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>				
<b>Course Evaluation:</b>	<p>Passing Grade: 50%, D</p> <p>A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.</p>				
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>1.Late hand in penalties will be -10% per day.</p> <p>2.If a student misses a test, he/she must have a valid reason (i.e. medical or family emergency documentation shall be required). In addition, the instructor <b>MUST</b> be notified <b>PRIOR</b> to the test sitting. If this procedure is not followed the student will receive a mark of zero on the test with no make-up option.</p> <p>3.Re-writes are <b>NOT</b> allowed for any written assignment, quiz or test.</p> <p>4.Course attendance is mandatory. Any student that is not present for the first 3 classes in each course, will be deemed to have not completed the required safety orientation for the course and will not be permitted to continue. One percent (1 %) per hour will be deducted from the final course grade for unexcused* absence. Any unexcused attendance beyond 15% of the total allocated course hours will result in the student receiving a failing grade for the course.</p> <p>Valid reasons would include: Doctors note Family Death or Serious Illness supported by a written note.</p> <p>Unexcused absence* will be determined in a case by case basis by the instructor of each course.</p>				
<b>Books and Required Resources:</b>	<p>IPT`s Metal Trades &amp; Welding Publisher: IPT Publishing &amp; Training Ltd</p> <p>Kit: ILM Post Secondary Package by Alberta Government Publisher: AK Graphics, Sault College Print Shop</p>				
<b>Course Outcomes and Learning Objectives:</b>	<table border="1"> <thead> <tr> <th data-bbox="508 1168 800 1203"><b>Course Outcome 1</b></th> <th data-bbox="808 1168 1442 1203"><b>Learning Objectives for Course Outcome 1</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="508 1211 800 1446">Curriculum based on demonstrating the knowledge and skills required to be competent in the gas tungsten arc welding process while following applicable industry standards and codes.</td> <td data-bbox="808 1211 1442 1446"> <p>Upon successful completion of this course, the student will demonstrate the ability to:</p> <p>1. Describe the power sources required for the gas tungsten arc welding process.</p> <ul style="list-style-type: none"> <li>- Constant current power sources.</li> <li>- Alternating current and direct current.</li> <li>- Power source requirements.</li> <li>- Power source options and features.</li> <li>- Power source set up and maintenance.</li> </ul> </td> </tr> </tbody> </table>	<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>	Curriculum based on demonstrating the knowledge and skills required to be competent in the gas tungsten arc welding process while following applicable industry standards and codes.	<p>Upon successful completion of this course, the student will demonstrate the ability to:</p> <p>1. Describe the power sources required for the gas tungsten arc welding process.</p> <ul style="list-style-type: none"> <li>- Constant current power sources.</li> <li>- Alternating current and direct current.</li> <li>- Power source requirements.</li> <li>- Power source options and features.</li> <li>- Power source set up and maintenance.</li> </ul>
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- 2. Describe the process requirements in regards to filler metals, electrodes and shielding gasses.
  - Shielding gasses.
  - AWS electrode classifications.
  - AWS and CSA filler metal classifications.
  - Proper selection of filler metals, electrodes and shielding gasses.
- 3. Understand the proper procedures and requirements for welding of various metals with the gas tungsten arc welding process.
  - GTAW aluminum and its alloys.
  - GTAW stainless steels and its alloys.
  - GTAW mild carbons steels and their alloys.
- 4. Describe maintenance and trouble shooting of gas tungsten arc welding equipment.
  - GTAW torch assembly.
  - GTAW flow meters and regulators.
  - GTAW hoses and cables
- 5. Demonstrate the ability to weld with the gas tungsten arc welding process.
  - Produce acceptable welds on mild steel.

**Evaluation Process and Grading System:**

<b>Evaluation Type</b>	<b>Evaluation Weight</b>
1F Lap Carbon Steel	15%
1F Lap/Tee Aluminum	15%
1F Lap/Tee Stainless Steel	15%
1F Tee Carbon Steel	10%
2F Lap Carbon Steel	15%
2F Tee Carbon Steel	10%
3F Tee Carbon Steel	10%
Employability Skills	10%

**Date:** January 6, 2022

**Addendum:** Please refer to the course outline addendum on the Learning Management System for further information.

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