



## COURSE OUTLINE: WLD121 - WELDING

Prepared: Dave Holley

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	WLD121: WELDING
<b>Program Number: Name</b>	5082: MECH.TECH.IND.MAINT.
<b>Department:</b>	IRONWKR APPR./WELDING RELATED
<b>Semesters/Terms:</b>	19F, 20W
<b>Course Description:</b>	A trades curriculum that has been designed to provide students with a combination of theoretical knowledge and hands-on skill in relation to the safe use and operation of both OFG/SMA welding, cutting and heating equipment.
<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>Substitutes:</b>	CCT121, MET100
<b>This course is a pre-requisite for:</b>	WLD200
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>5082 - MECH.TECH.IND.MAINT.</b> VLO 1 Complete all work in compliance with current legislation, standards, regulations and guidelines. VLO 10 Select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	
<b>Essential Employability Skills (EES) addressed in this course:</b>	EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	1. Late hand-in penalties will be -10% per day. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances (as determined by instructor). 2. If a student misses a test/lab he/she must have a valid reason (i.e. medical or family emergency documentation shall be required). In addition, the instructor MUST be notified PRIOR to the test or lab sitting. If this procedure is not followed the student will receive a mark of zero on the test/lab with no make-up option. 3.Re-writes are NOT allowed for any written assignment, quiz or test. 4.Repeats are NOT allowed for any shop test. 5.Course attendance is mandatory. One percent (1 %) per hour will be deducted from the final



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	<p>course grade for unexcused* absence.</p> <p>Any absence without a written, valid reason will be deemed unexcused.</p> <p>Valid reasons would include:  Doctors note  Family Death or Serious Illness supported by a written note.</p>												
<b>Books and Required Resources:</b>	<p>ILM Welding Bundle *A* (OXY/OXY/SMA/MILD/WEL) by Alberta ILM  Publisher: AK Graphics</p>												
<b>Course Outcomes and Learning Objectives:</b>	<table> <tr> <th>Course Outcome 1</th><th>Learning Objectives for Course Outcome 1</th></tr> <tr> <td>1. Personal Protective Equipment for Oxy-Fuel Gas Welding Cutting and Heating Operations.</td><td> <p>Potential Elements of the Performance:</p> <p>1.1 Identify proper eye, hand and face protection  1.2 Identify proper footwear and clothing  1.3 Identify and select filter lenses  1.4 Describe the effects of exposure to infra red radiation  1.5 Locate and identify shop ventilation controls  1.6 Locate and identify emergency exits  1.7 Locate and identify manifold shut-off valves for the shop gas system  1.8 Understand emergency shop evacuation procedures</p> </td></tr> <tr> <th>Course Outcome 2</th><th>Learning Objectives for Course Outcome 2</th></tr> <tr> <td>2. Construction of Oxygen Acetylene and other Fuel Gas Cylinders.</td><td> <p>Potential Elements of the Performance:</p> <p>2.1 Describe the physical construction of both acetylene and oxygen cylinders  2.2 Locate and identify the built-in safety devices for both acetylene and oxygen cylinders  2.3 Identify both acetylene and oxygen cylinders, hoses, regulators and fittings  2.4 Identify basic physical properties and dangers associated with the use of acetylene gas  2.5 Identify basic physical properties and dangers associated with the use of oxygen gas  2.6 Describe proper procedures for cylinder handling  2.7 Pressurize and purge regulators, hoses, torch body and tips  2.8 Explain the dangers associated to the hazards of backfire and flashback  2.9 Explain the correct safe response to backfire and flashback  2.10 Perform specified procedures for flame ignition and adjustment</p> </td></tr> <tr> <th>Course Outcome 3</th><th>Learning Objectives for Course Outcome 3</th></tr> <tr> <td>3. Observe Demonstrations of the Braze Welding and Fusion Welding Processes c/w their Required Equipment.</td><td> <p>Potential Elements of the Performance:</p> <p>3.1 Observe and identify fusion welding and braze welding equipment to include:  3.2 Gas supply (cylinders vs manifold lines)  3.3 Regulators  3.4 Hoses  3.5 Torch handles  3.6 Welding tips  3.7 Filler metals</p> </td></tr> </table>	Course Outcome 1	Learning Objectives for Course Outcome 1	1. Personal Protective Equipment for Oxy-Fuel Gas Welding Cutting and Heating Operations.	<p>Potential Elements of the Performance:</p> <p>1.1 Identify proper eye, hand and face protection  1.2 Identify proper footwear and clothing  1.3 Identify and select filter lenses  1.4 Describe the effects of exposure to infra red radiation  1.5 Locate and identify shop ventilation controls  1.6 Locate and identify emergency exits  1.7 Locate and identify manifold shut-off valves for the shop gas system  1.8 Understand emergency shop evacuation procedures</p>	Course Outcome 2	Learning Objectives for Course Outcome 2	2. Construction of Oxygen Acetylene and other Fuel Gas Cylinders.	<p>Potential Elements of the Performance:</p> <p>2.1 Describe the physical construction of both acetylene and oxygen cylinders  2.2 Locate and identify the built-in safety devices for both acetylene and oxygen cylinders  2.3 Identify both acetylene and oxygen cylinders, hoses, regulators and fittings  2.4 Identify basic physical properties and dangers associated with the use of acetylene gas  2.5 Identify basic physical properties and dangers associated with the use of oxygen gas  2.6 Describe proper procedures for cylinder handling  2.7 Pressurize and purge regulators, hoses, torch body and tips  2.8 Explain the dangers associated to the hazards of backfire and flashback  2.9 Explain the correct safe response to backfire and flashback  2.10 Perform specified procedures for flame ignition and adjustment</p>	Course Outcome 3	Learning Objectives for Course Outcome 3	3. Observe Demonstrations of the Braze Welding and Fusion Welding Processes c/w their Required Equipment.	<p>Potential Elements of the Performance:</p> <p>3.1 Observe and identify fusion welding and braze welding equipment to include:  3.2 Gas supply (cylinders vs manifold lines)  3.3 Regulators  3.4 Hoses  3.5 Torch handles  3.6 Welding tips  3.7 Filler metals</p>
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	<p>3.8 Face and eye protection</p> <p>3.9 Observe procedures for setting up, pressurizing, purging and shutting down oxyacetylene welding equipment</p> <p>3.10 Describe potential fire, fume and explosion hazards associated with the welding, flame cutting and heating of metals</p> <p>3.11 Observe and identify common welding techniques to include:</p> <p>3.12 Base metal cleaning and preheating</p> <p>3.13 Fusion welding of a mild steel bead and joint</p> <p>3.14 Destructive testing of same</p> <p>3.15 Braze welding of a mild steel bead and joint</p> <p>3.16 Destructive testing of same</p> <p>3.17 Complete a Demonstration Report Format on the above course material</p>
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
<p>4. Perform Flame Cutting Operations on Mild Steel. Observe and identify flame cutting equipment to include:</p>	<p>4.1 Gas supply (cylinders vs manifold lines)</p> <p>4.2 Regulators</p> <p>4.3 Hoses</p> <p>4.4 Torch handles</p> <p>4.5 Cutting tips</p> <p>4.6 Face and eye protection</p> <p>4.7 Observe procedures for setting up, pressurizing, purging and shutting down oxyacetylene flame cutting equipment</p> <p>4.8 Perform a routine inspection of individual workstation to determine the condition of the torch body, hoses, regulators and tips</p> <p>4.9 Correct / report workstation deficiencies prior to the commencement of shop assignments</p> <p>4.10 Perform flame cutting exercises on mild steel to include</p> <p>4.11 Square cut a straight line</p> <p>4.12 Square cut a shaped line</p> <p>4.13 Bevel cut a straight line</p> <p>4.14 Pierce mild steel and cut holes</p>
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
<p>5. Arc Welding Terms and Equipment.</p>	<p>Potential Elements of the Performance:</p> <p>5.1 Define or describe the following terms</p> <p>5.2 Fusion</p> <p>5.3 Penetration</p> <p>5.4 Leg Size</p> <p>5.5 Profile</p> <p>5.6 Defect / Discontinuity</p> <p>5.7 Describe the Basic Principles behind each of the following:</p> <ul style="list-style-type: none"> <li>- SMAW Process</li> <li>- Welding Current and Polarity</li> <li>- AC and DC Welding Machines</li> <li>- Arc Blow</li> </ul>
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
<p>6. CAS and AWS Classification of SMAW Electrodes.</p>	<p>Potential Elements of the Performance:</p> <p>6.1 Identify, select electrodes by</p> <p>6.2 Classification</p> <p>6.3 Diameter</p>



		6.4 Desired Weld Appearance 6.5 Identify and select the correct operating current for electrodes based upon -Diamete Joint Design -Required Strength 6.6 Identify the correct storage and handling procedures for each of the following - electrode types - Low Hydrogen - Non-Low Hydrogen						
	<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>						
	7. Arc Welding Operations.	Potential Elements of the Performance 7.1 Adjust SMAW equipment and settings according to the demands of single and multi-pass fillet and groove welds 7.2 Deposit single and multi-pass fillet welds on mild steel, in the flat position 7.3 Identify and troubleshoot the cause(s) of weld defects 7.4 Identify and explain limited repair and service activities related to electrode cables, holders, welding machines and protective equipment						
<b>Evaluation Process and Grading System:</b>	<table><tr><th>Evaluation Type</th><th>Evaluation Weight</th></tr><tr><td>Shop Assignments</td><td>65%</td></tr><tr><td>Theory Test</td><td>35%</td></tr></table>		Evaluation Type	Evaluation Weight	Shop Assignments	65%	Theory Test	35%
Evaluation Type	Evaluation Weight							
Shop Assignments	65%							
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<b>Date:</b>	July 25, 2019							
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.							

