



## COURSE OUTLINE: HET811 - TRADE PRACTICES

Prepared: Josh Boucher

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	HET811: TRADE PRACTICES
<b>Program Number: Name</b>	
<b>Department:</b>	MOTIVE POWER APPRENTICESHIP
<b>Semesters/Terms:</b>	20W
<b>Course Description:</b>	Upon successful completion the apprentice is able to perform shielded metal arc welding Procedures and metal inert gas (MIG) welding procedures following manufacturers` recommendations, government regulations, and safe work practices.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	0
<b>Total Hours:</b>	24
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<div><div>EES 1</div><div>Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.</div></div> <div><div>EES 2</div><div>Respond to written, spoken, or visual messages in a manner that ensures effective communication.</div></div> <div><div>EES 3</div><div>Execute mathematical operations accurately.</div></div> <div><div>EES 4</div><div>Apply a systematic approach to solve problems.</div></div> <div><div>EES 5</div><div>Use a variety of thinking skills to anticipate and solve problems.</div></div> <div><div>EES 6</div><div>Locate, select, organize, and document information using appropriate technology and information systems.</div></div> <div><div>EES 7</div><div>Analyze, evaluate, and apply relevant information from a variety of sources.</div></div> <div><div>EES 8</div><div>Show respect for the diverse opinions, values, belief systems, and contributions of others.</div></div> <div><div>EES 9</div><div>Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</div></div> <div><div>EES 10</div><div>Manage the use of time and other resources to complete projects.</div></div> <div><div>EES 11</div><div>Take responsibility for ones own actions, decisions, and consequences.</div></div>
<b>Course Evaluation:</b>	Passing Grade: 50%,
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<div>Grade</div> <div>Definition Grade Point Equivalent</div> <div>A+ 90 - 100% 4.00</div> <div>A 80 - 89%</div> <div>B 70 - 79% 3.00</div> <div>C 60 - 69% 2.00</div> <div>D 50 - 59% 1.00</div> <div>F (Fail)49% and below 0.00</div>



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CR (Credit) Credit for diploma requirements has been awarded.  
 S Satisfactory achievement in field /clinical placement or non-graded subject area.  
 U Unsatisfactory achievement in field/clinical placement or non-graded subject area.  
 X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.  
 NR Grade not reported to Registrar's office.  
 W Student has withdrawn from the course without academic penalty.

**Books and Required Resources:**

Course Pack HET801

**Course Outcomes and Learning Objectives:**

Course Outcome 1	Learning Objectives for Course Outcome 1
1.1 Shielded Metal Arc Welding (SMAW) Upon successful completion the apprentice is able to perform shielded metal arc welding procedures following manufacturers' recommendations, government regulations, and safe work practices.	<p>1.1.1 Explain the purpose and fundamentals of the shielded metal arc welding process.</p> <ul style="list-style-type: none"> <li>- metallurgy</li> <li>- arc emissions</li> <li>- electrical polarity</li> <li>- electrical fundamentals</li> </ul> <p>1.1.2 Identify the function, construction features, and application of shielded metal arc welding equipment and consumables.</p> <ul style="list-style-type: none"> <li>- transformers</li> <li>- rectifiers</li> <li>- controls</li> <li>- electrode holders</li> <li>- electrode specifications               <ul style="list-style-type: none"> <li>• codes</li> <li>• current type and polarity</li> <li>• position</li> <li>• penetration</li> <li>• base metal material</li> <li>• material condition</li> </ul> </li> <li>- duty cycle</li> </ul> <p>1.1.3 Describe the principles of operation of shielded metal arc welding equipment.</p> <ul style="list-style-type: none"> <li>- equipment settings</li> <li>- transformers</li> <li>- rectifiers</li> <li>- stationary and portable units</li> <li>- closed circuit voltage</li> <li>- open circuit voltage</li> </ul> <p>1.1.4 Perform inspection and diagnostic procedures following manufacturers' recommendations of shielded metal arc welds.</p> <ul style="list-style-type: none"> <li>- describe and diagnose defective welds               <ul style="list-style-type: none"> <li>• porosity</li> <li>• lack of penetration</li> <li>• excessive heat</li> <li>• contamination</li> </ul> </li> <li>- identify causes of defective welds</li> </ul>



		<p>1.1.5 Identify maintenance procedures for shielded metal arc welding equipment following manufacturers' recommendations.</p> <ul style="list-style-type: none"> <li>- welding cables</li> <li>- holding devices</li> <li>- power sources</li> <li>- protective equipment</li> </ul> <p>1.1.6 Perform the assigned shielded metal arc welding procedures following manufacturers' recommendations and safe work practices.</p> <ul style="list-style-type: none"> <li>- machine adjustments and welds</li> <li>- trial beads</li> <li>- single and multi pass butt and fillet welds in flat position</li> </ul>
	<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
	<p>1.2 Metal Inert Gas (MIG) Welding</p> <p>Upon successful completion the apprentice is able to perform metal inert gas (MIG) welding procedures following manufacturers' recommendations, government regulations, and safe work practices.</p>	<p>1.2.1 Explain the purpose and fundamentals of the metal inert gas (MIG) welding process.</p> <ul style="list-style-type: none"> <li>- electrical fundamentals</li> <li>- electrical polarity</li> <li>- power sources</li> <li>- wire feeders</li> <li>- gas shielding</li> </ul> <p>1.2.2 Identify the function, construction features, composition, types, and application of metal inert gas (MIG) welding equipment and consumables.</p> <ul style="list-style-type: none"> <li>- power sources <ul style="list-style-type: none"> <li>• rectifier</li> <li>• generator</li> <li>• inverter</li> </ul> </li> <li>- consumables <ul style="list-style-type: none"> <li>• wire types</li> <li>• wire specifications</li> <li>• wire sizes</li> <li>• shielding gases</li> <li>• contact tips</li> </ul> </li> </ul> <p>1.2.3 Describe the principles of operation and set-up of metal inert gas (MIG) welding equipment.</p> <ul style="list-style-type: none"> <li>- gun angle and travel</li> <li>- wire drive <ul style="list-style-type: none"> <li>• pressure</li> <li>• speed</li> <li>• groove design</li> </ul> </li> <li>- contact tip <ul style="list-style-type: none"> <li>• cleanliness</li> <li>• gas flow</li> <li>• wire speed</li> </ul> </li> <li>- voltage setting <ul style="list-style-type: none"> <li>• metal thickness and type</li> </ul> </li> <li>- shielding gas <ul style="list-style-type: none"> <li>• flow rate</li> </ul> </li> </ul> <p>1.2.4 Perform inspection and diagnostic procedures of metal</p>

	<p>inert gas (MIG) welding operations.</p> <ul style="list-style-type: none"> <li>- inspect and diagnose weld defects <ul style="list-style-type: none"> <li>• spatter</li> <li>• porosity</li> <li>• lack of penetration</li> <li>• excessive heat</li> <li>• wire speed</li> </ul> </li> <li>o too fast</li> <li>o too slow <ul style="list-style-type: none"> <li>• shielding gas</li> </ul> </li> <li>o selection</li> <li>o flow rate</li> </ul> <p>1.2.5 Identify maintenance procedures for metal inert gas (MIG) welding equipment following manufacturers' recommendations.</p> <ul style="list-style-type: none"> <li>- drive roll pressure</li> <li>- cable conduit cleanliness</li> <li>- contact tip condition</li> <li>- gas nozzle condition</li> </ul> <p>1.2.6 Perform assigned operations for metal inert gas (MIG) welding procedures following manufacturers' recommendations and safe work practices.</p> <ul style="list-style-type: none"> <li>- weld deposits on lap and T joints</li> <li>- adjustments to: <ul style="list-style-type: none"> <li>• voltage</li> <li>• wire speed</li> <li>• gas flow</li> <li>• electrode protrusion</li> </ul> </li> </ul>						
<b>Evaluation Process and Grading System:</b>	<table> <tr> <th>Evaluation Type</th><th>Evaluation Weight</th></tr> <tr> <td>Practical Application Testing</td><td>50%</td></tr> <tr> <td>Theory Testing</td><td>50%</td></tr> </table>	Evaluation Type	Evaluation Weight	Practical Application Testing	50%	Theory Testing	50%
Evaluation Type	Evaluation Weight						
Practical Application Testing	50%						
Theory Testing	50%						
<b>Date:</b>	February 10, 2020						
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.						