



## COURSE OUTLINE: MTF211 - ASSEMBLY FABRICATION

Prepared: Corey Garson

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	MTF211: ASSEMBL/FABRICATION OF DETAIL COMPONENTS
<b>Program Number: Name</b>	4051: METAL FABRICATION
<b>Department:</b>	IRONWKR APPR./WELDING RELATED
<b>Academic Year:</b>	2023-2024
<b>Course Description:</b>	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.
<b>Total Credits:</b>	5
<b>Hours/Week:</b>	5
<b>Total Hours:</b>	70
<b>Prerequisites:</b>	MTF131
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Substitutes:</b>	MTF230
<b>This course is a pre-requisite for:</b>	MTF236
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<p><b>4051 - METAL FABRICATION</b></p> <p>VLO 1 Interpret blueprints and produce basic drawings and bills of materials.</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 4 Create and use patterns and templates using common layout and measuring tools.</p> <p>VLO 5 Understand and use a variety of destructive and non-destructive methods to test welds.</p> <p>VLO 6 Develop project plans relating to component and sub-assembly production.</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>
<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>	<ol style="list-style-type: none"> <li>1. Late hand in penalties will be -10% per day.</li> <li>2. If a student misses a test or 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 sitting. If this procedure is not followed the student will receive a mark of zero on the test with no make-up option.</li> <li>3. Re-writes are NOT allowed for any written assignment, quiz or test.</li> <li>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.</li> </ol> <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="505 1034 805 1069"><b>Course Outcome 1</b></th> <th data-bbox="805 1034 1446 1069"><b>Learning Objectives for Course Outcome 1</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="505 1069 805 1444">Apply safe work practices according to Occupational Health and Safety Act (OHS) legislation.</td> <td data-bbox="805 1069 1446 1444"> 1.1 Identify hazards for welding and cutting operations.  1.2 Identify the use of personal protective equipment for welding and cutting operations.  1.3 Explain the hazards involved with welding fumes and gases.  1.4 Identify welding fume ventilation methods.  1.5 Explain the effects of electricity and precautions used to prevent injury.  1.6 Describe the procedure for welding or cutting in confined spaces or potentially dangerous enclosures. </td> </tr> </tbody> </table>	<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>	Apply safe work practices according to Occupational Health and Safety Act (OHS) legislation.	1.1 Identify hazards for welding and cutting operations. 1.2 Identify the use of personal protective equipment for welding and cutting operations. 1.3 Explain the hazards involved with welding fumes and gases. 1.4 Identify welding fume ventilation methods. 1.5 Explain the effects of electricity and precautions used to prevent injury. 1.6 Describe the procedure for welding or cutting in confined spaces or potentially dangerous enclosures.
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	1.7 Interpret sections of the occupational Health and Safety Act General Safety Regulations
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
Describe the safety practices for hazardous materials and fire protection in your trade.	2.1 Describe the roles, responsibilities, features and practices related to the Workplace Hazardous Materials Information System (WHMIS) program. 2.2 Describe the three key elements of WHMIS. 2.3 Describe handling, storing and transporting procedures when dealing with hazardous materials. 2.4 Describe safe venting procedures when working with hazardous materials. 2.5 Describe fire hazards, classes, procedures and equipment related to fire protection.
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
Use hand tools.	3.1 Describe Safety precautions for hand tools. 3.2 Identify layout and measuring tools and their uses. 3.3 Identify clamping tools and their uses. 3.4 Identify cutting tools and their uses. 3.5 Identify other hand tools used by welders.
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
Use power tools.	4.1 Demonstrate the operation of bench, pedestal, angle and straight grinders. 4.2 Demonstrate the operation of portable power drills, drill presses and twist drills. 4.3 Describe the operation of metal forming and shaping tools. 4.4 Describe the operation of metal cutting tools.
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
Perform oxyfuel cutting.	5.1 Describe how to operate a hand-held oxyfuel cutting torch on mild steel plate. 5.2 Perform straight line, bevel and shape cutting on mild steel plate. 5.3 Pierce and cut holes in mild steel plate.
<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
Cut using the plasma arc cutting process.	6.1 Describe the plasma arc cutting process and equipment. 6.2 Perform plasma arc cutting.
<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>



Identify distortion and methods of control.	7.1 Identify how heat and temperature relate to distortion. 7.2 Identify three types of distortion, their causes and control of each type. 7.3 Describe the mechanical, procedural and design methods of controlling distortion.
<b>Course Outcome 8</b>	<b>Learning Objectives for Course Outcome 8</b>
Identify shapes drawings and drawing equipment.	8.1 Describe drawing tools. 8.2 Describe the parts of geometric shapes and angles. 8.3 Apply layouts.
<b>Course Outcome 9</b>	<b>Learning Objectives for Course Outcome 9</b>
Describe layout procedures.	9.1 Describe layout and abbreviations and symbols. 9.2 Describe Layout tools and mark-up methods. 9.3 Describe templates. 9.4 Describe procedure for flat plate utilization. 9.5 Identify pipe sizes and schedules. 9.6 Describe pipe layout tools.
<b>Course Outcome 10</b>	<b>Learning Objectives for Course Outcome 10</b>
Fabricate projects to required tolerances and specifications.	10.1 Plan for fabrication process by using drawings and selecting materials required. 10.2 Prepare for fabrication by creating an order of operations to create components and sub-components. 10.3 Verify all measurements and calculations. 10.4 Select proper tools and equipment for the task. 10.5 Perform proper tacking and welding techniques to ensure distortion is minimized. 10.6 Verify dimensions of finished components for acceptable tolerances.

**Evaluation Process and Grading System:**

<b>Evaluation Type</b>	<b>Evaluation Weight</b>
Employability Skills	20%
Project 1	20%
Project 2	20%
Project 3	40%

**Date:**

May 31, 2023



**Addendum:**

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

