COURSE OUTLINE: MTF109 - OXY FUSION/BRAZE WEL

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Course Code: Title	MTF109: OXY FUSION AND BRAZE WELDING
Program Number: Name	4051: METAL FABRICATION 4053: WELDING TECHNIQUES
Department:	IRONWKR APPR./WELDING RELATED
Academic Year:	2024-2025
Course Description:	This course teaches students how to safely set up Oxyfuel equipment, how to safely use the equipment, torch cut various thickness of metal materials, fusion weld with or without filler metal, and braze. Techniques needed to weld and cut, will develop hand eye skills required to be a welder.
Total Credits:	2
Hours/Week:	2
Total Hours:	28
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Substitutes:	MTF136
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4051 - METAL FABRICATION** VLO 2 Apply knowledge of various welding and metal cutting techniques and theories to produce components and sub-assemblies. VLO 3 Prepare materials by utilizing fabrication machinery and equipment. VLO 5 Understand and use a variety of destructive and non-destructive methods to test welds. 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. VLO 8 Work responsibly and effectively in accordance with government safety regulations, manufacturer's recommendations and approved industry standards. **4053 - WELDING TECHNIQUES** VLO 1 Perform work responsibly and in compliance with the Occupational Health and Safety Act. VLO 3 Recognize and understand use of welding symbols. VLO 6 Perform weld applications utilizing Shielded Metal Arc (SMAW), Flux Core (FCAW) and Gas Metal Arc (GMAW Mig Welding) welding equipment. VLO 7 Use welding techniques according to industry standards. VLO 8 Create high quality welds on various types of materials and create joints in the flat, horizontal, vertical and overhead positions.

	VLO 9 Identify defect in welds, demonstrate how to prevent them and define procedures for correction of defective weld quality.
Essential Employability Skills (EES) addressed in this course:	EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	1.Late hand in penalties will be -10% per day. 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 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. 3.Re-writes are NOT allowed for any written assignment, quiz or test. 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. Valid reasons would include: Doctors note Family Death or Serious Illness supported by a written note. Unexcused absence* will be determined in a case by case basis by the instructor of each course.
Books and Required Resources:	CWB Post Secondary Package by CWB Education Publisher: CWB Group IPT`s Guide To Blueprint Interpretation by Grant E. Jacobs Publisher: IPT Publishing & Training Ltd. Welding Supplies available at LINDE and Air Liquide Sault Ste. Marie by Welding Supplies

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Apply safe work practices according to Occupational Health and Safety Act (OHSA) 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. 1.7 Interpret sections of the occupational Health and Safety Act General Safety Regulations
Course Outcome 2	**Learning Objectives for Course Outcome 2**
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.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Assemble oxyfuel equipment.	3.1 Describe the characteristics and handling procedures for oxygen and fuel gases. 3.2 Describe the functions of oxyfuel equipment components. 3.3 Demonstrate the use, care and maintenance of oxyfuel equipment components. 3.4 Explain the procedure for placement, set-up and shutting down of oxyfuel equipment. 3.5 Identify causes and preventive measures for backfires, burn backs and flashbacks. 3.6 Describe pressure and flame adjustments.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Perform oxyfuel cutting and gouging.	4.1 Describe how to operate a hand-held oxyfuel cutting torch on mild steel plate. 4.2 Perform straight line, bevel and shape cutting on mild steel plate. 4.3 Pierce and cut holes in mild steel plate. 4.4 Perform gouging on mild steel plate.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Perform oxyfuel welding and braze welding.	5.1 Describe filler rods and fluxes. 5.2 Demonstrate the ability to run lines of fusion with and without filler rods. 5.3 Demonstrate the ability to weld lap joints on mild steel. 5.4 Demonstrate the ability to weld butt joints on mild steel. 5.5 Demonstrate the ability to braze weld lap joints on mild steel. 5.6 Demonstrate the ability to braze weld butt joints on mild steel.

Evaluation Process and Grading System:	

Evaluation Type	Evaluation Weight
Braze Welding	15%
Cutting	30%
Employability Skills	10%
Fusion Welding	30%
Gouging	15%

Date:	July 12, 2024
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.