COURSE OUTLINE: MTF210 - SMAW - ADVANCED

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Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MTF210: SHIELDED METAL ARC WELDING - ADVANCED
Program Number: Name	4051: METAL FABRICATION
Department:	IRONWKR APPR./WELDING RELATED
Academic Year:	2022-2023
Course Description:	This course increases your knowledge of SMAW arc reactions and improves your hand skills to a higher level of competency. The course presents procedures that have proven successful for performing open root groove welds on mild steel using SMAW.
Total Credits:	2
Hours/Week:	2
Total Hours:	28
Prerequisites:	MTF107, MTF137
Corequisites:	There are no co-requisites for this course.
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.
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:

IPT`s Metal Trades & Welding
Publisher: IPT Publishing & Training Ltd.

Kit: ILM Post-Secondary Package by Alberta Government
Publisher: AK Graphics, Sault College Print Shop

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**
Identify joints and weld types.	3.1 Identify the five basic joints. 3.2 Describe the types of welds and their dimensions. 3.3 Identify joint and weld type variations. 3.4 Outline the considerations in the design of a joint for welding.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Interpret welding symbols.	4.1 Explain the purpose of welding symbols. 4.2 Define weld symbol, welding symbol and supplementary symbols. 4.3 Interpret weld symbols and welding symbols. 4.4 Identify the dimensioning of welding symbols. 4.5 Interpret non-destructive testing symbols.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Identify SMAW equipment.	5.1 Define SMAW related terms. 5.2 Identify welding cables and accessories for welding power sources. 5.3 Identify the effect of arc length on amperage and voltage.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
Select mild steel electrodes for SMAW.	6.1 Define the terms associated with SMAW electrodes. 6.2 Identify the CSA and AWS classification and specifications for SMAW electrodes. 6.3 Identify the types and functions of SMAW electrode coatings. 6.4 Describe the functions of slag. 6.5 Describe care, handling and storage procedures for these electrodes. 6.6 Identify mild steel SMAW electrodes and their applications.
Course Outcome 7	**Learning Objectives for Course Outcome 7**

	Perform SMAW groove welds on mild steel.	7.1 Perform groove welds in the 1G, 2G, 3G and 4G positions using E4310 (E6010) root and E4918 (E7018) fill and cap.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
1G Test	20%
2G Test	20%
3G Test	20%
4G Test	20%
Employability Skills	20%

Date: June 27, 2022

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